144/430(440)MHz FM DUAL BANDER

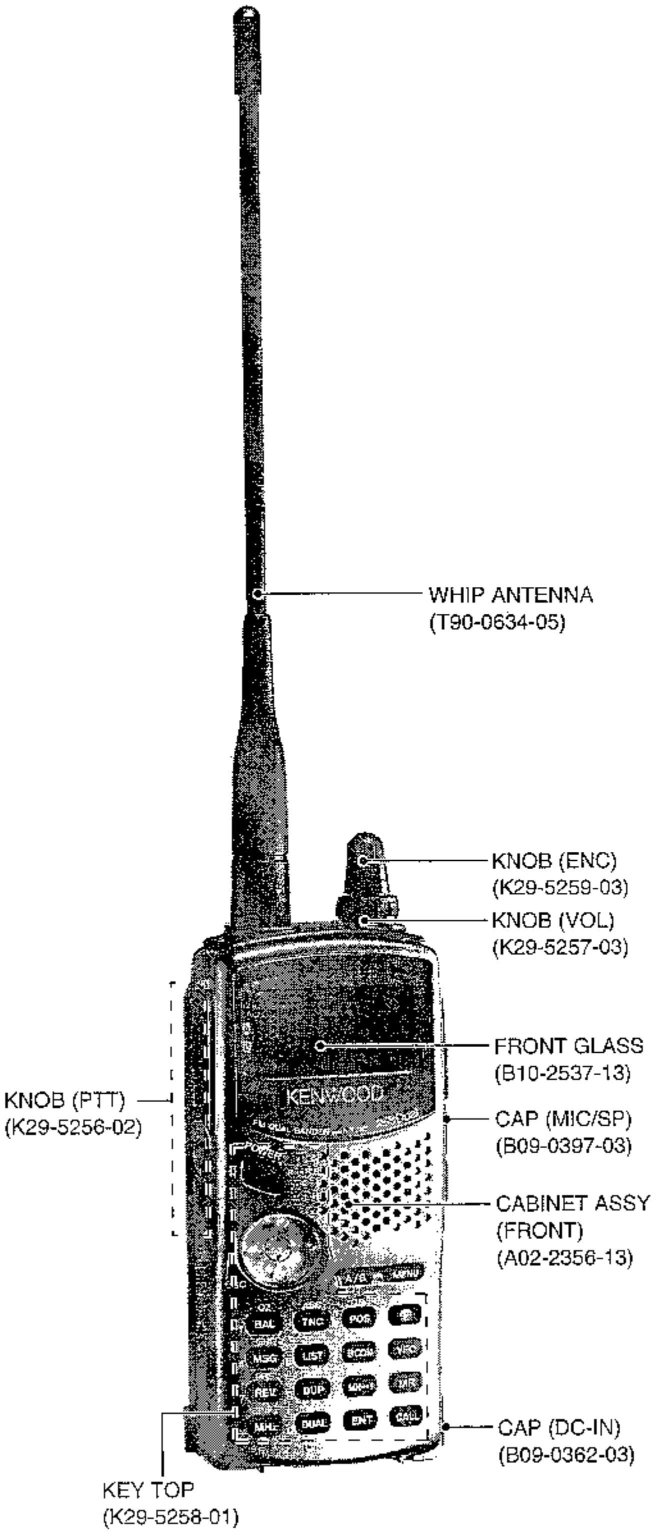
TH-D7A/E

SERVICE MANUAL

KENWOOD

KENW -05274

B51-8444-00(S) 801



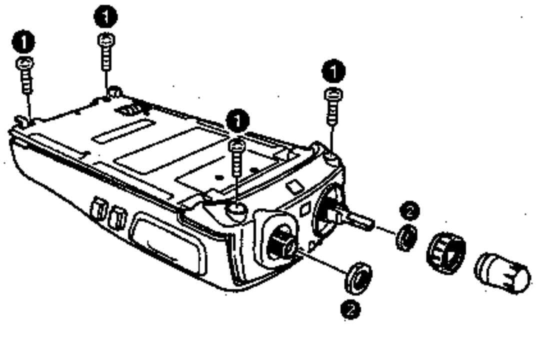
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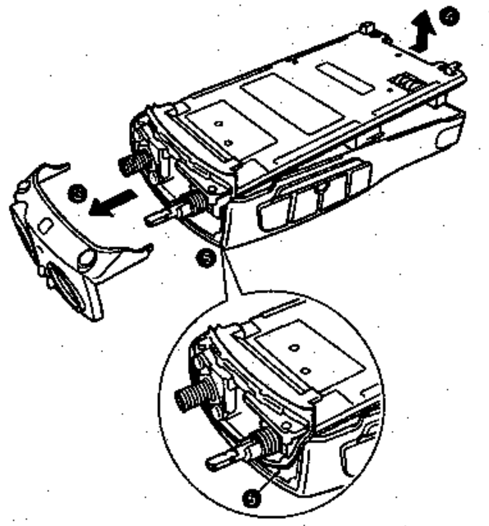
DISASSEMBLY FOR REPAIR

To open the main body:

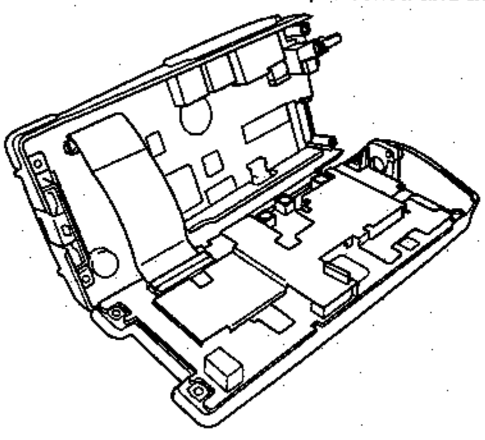
1. Remove the battery pack, whip antenna, and VOL/ENC knob, then remove the four screws (❶) on the rear chassis and the two nuts (❷) holding the VOL/ENC, SMA receptacle. (Use a special nut driver.)



2. Pull out the panel assembly (❸) and separate the chassis from the case gradually, beginning with the bottom (❹). Finally, remove the waterproof seal rubber (❺) from the groove, being careful not to break the rubber.



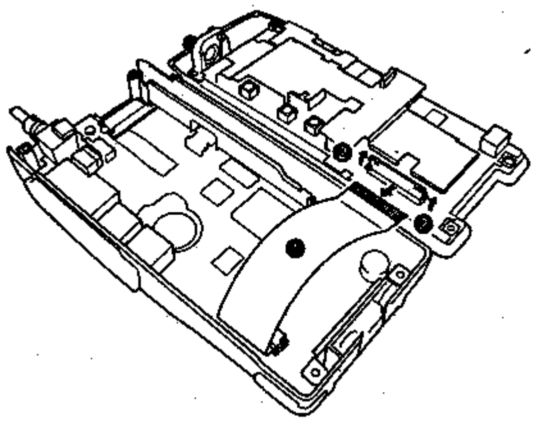
3. The main body is divided into two blocks: a case and a chassis. However, they are connected with a flat cable. The TH-D7A/E can be turned on, checked and adjusted.



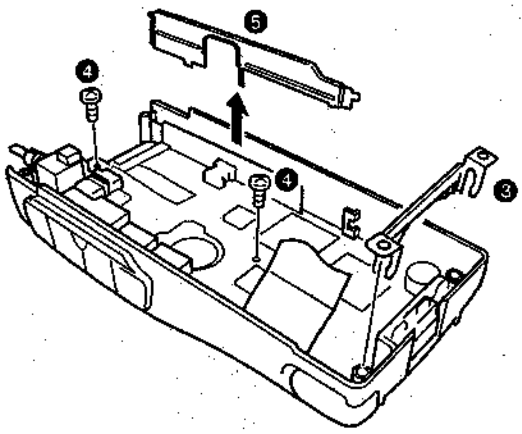
To remove the PC boards:

Control PC board (case side)

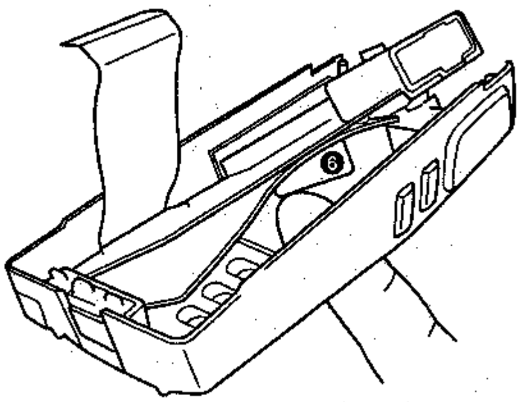
1. The flat cable (❶) connecting the case and the chassis can be disconnected by erecting the stopper (❷). (Do not force to remove the cable, or it may be damaged.)



2. To remove the control PC board, remove the holder (❺) and the two screws (❹) holding the PC board. Then slide the fitting (❸) on the back of the PTT switch to remove it.



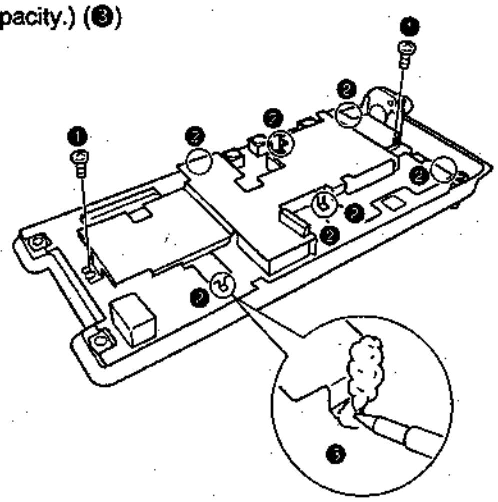
3. Push the cross key section (❻) on the key top upward from the front with a finger. The control PC board is lifted and removed from the case.



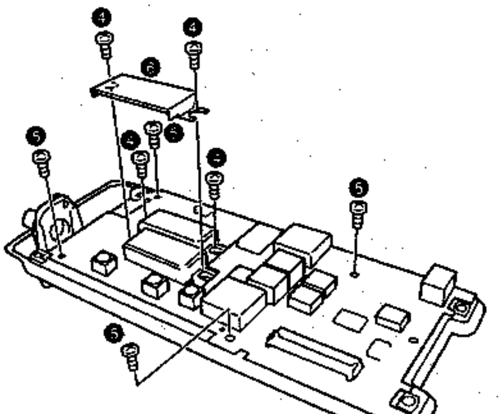
DISASSEMBLY FOR REPAIR

RF PC board (chassis side)

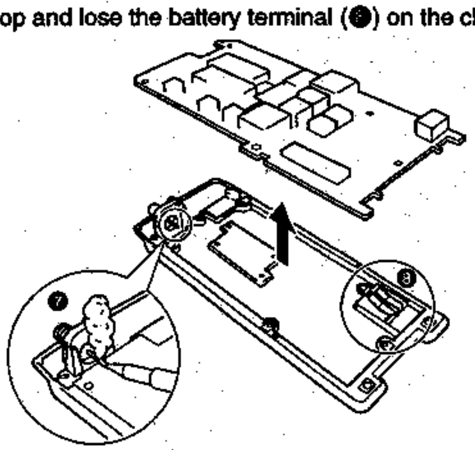
1. Remove the two screws (❶) and the seven solders (❷) to remove the shield. (Use a soldering iron with a large thermal capacity.) (❸)



2. Remove the four screws (❹) holding the power module and the four screws (❺) holding the PC board.
   (The VHF power module and the shield case (❻) are installed together.)

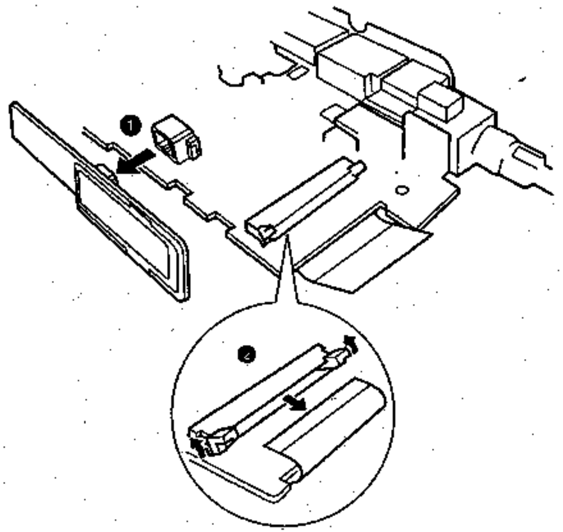


3. Finally, remove the solder (❼) from the ANT terminal to remove the RF PC board from the chassis. Take care not to drop and lose the battery terminal (❽) on the chassis.

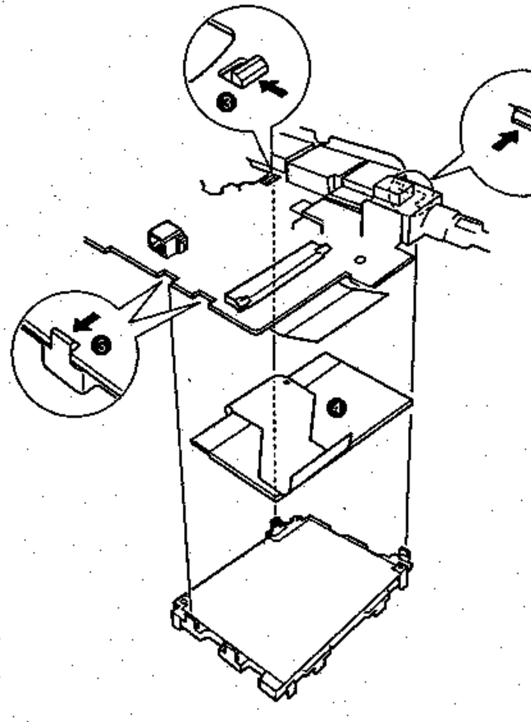


To remove the LCD assembly:

1. Remove the PTT PC board (X57: C/4) from the control PC board (❶). Remove the flat cable of the LCD assembly by erecting the connector stopper (❷).



2. Release the four hooks (❸) on the right guide from the control PC board. The right guide and LCD assembly (❹) will be detached.



Reassembly notes

- When replacing the power module, first install the screws, then solder the leads.
- Install the waterproof seal rubber with a special care not to deform it.

CIRCUIT DESCRIPTION

Note: See the block diagrams and circuit diagrams as required.

1. Frequency configuration

The TH-D7A/E has a VCO and a PLL unit for each of the VHF and UHF bands, so it can receive signals in these bands at the same time and implements full duplexing.
The VHF VCO is used for VHF transmission, the first local oscillator for the main VHF reception, and first local oscillator (doubled) for sub UHF reception. The UHF VCO is used for UHF transmission, the first local oscillator for the main UHF reception, and the first local oscillator (divided by two) for sub VHF reception.

The PLL reference signal is produced by the 12.8MHz oscillator circuit and used for both bands. The second local oscillator for the VHF band uses the tripled 12.8MHz reference signal frequency. The second local oscillator for the UHF band uses 45.05 MHz generated by the IF IC crystal oscillator circuit.

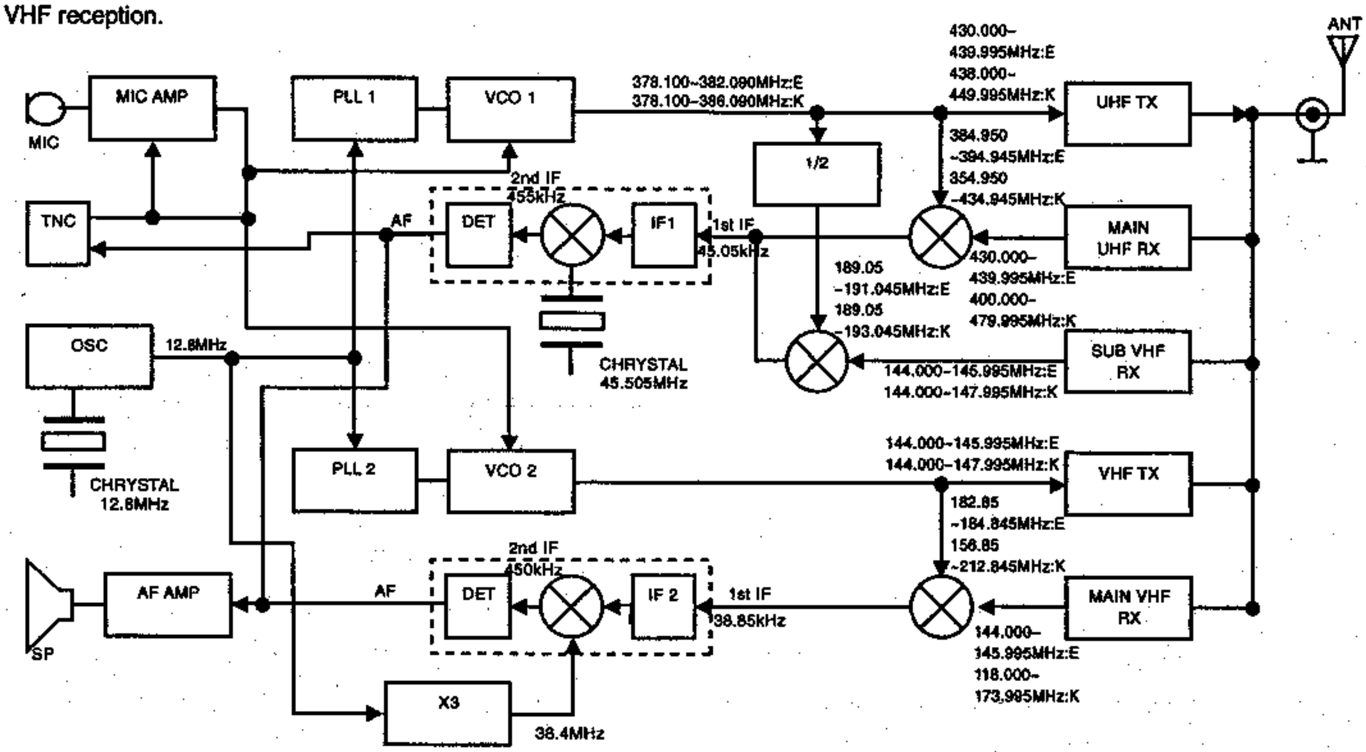


Fig.1 Frequency Configuration

2. Receiver system

■ Main VHF Receiver

The incoming signal from the antenna passes through a duplexer (LC) and a filter circuit. The signal is divided into the main and sub VHF receiver circuits. In the main VHF receiver, the signal enters the helical resonator (L72). This signal is amplified by the RF amplifier (Q53), passes through the two helical resonators (L71, L69) and goes to the mixer (Q50). The frequency of the signal is converted by the first local oscillator and upper hetero to produce a first IF signal of 38.85 MHz. The signal passes through the MCF (XF2) and enters IF IC (IC13). The signal is converted to the second IF signal of 450 kHz by the second local oscillator, which is three times 12.8 MHz, and the lower hetero, and detected to produce an audio signal.

■ Main UHF Receiver

The incoming signal from the antenna passes through a duplexer (LC) and a filter circuit, and enters the RF amplifier (Q40). The amplified signal is divided into the main UHF receiver and the sub VHF receiver. In the main UHF receiver, the signal passes through the SAW filter (L30) and enters the mixer (Q39). The frequency of the signal is converted by the first local oscillator and lower hetero to produce a first IF signal of 45.05 MHz. The signal passes through the MCF (XF1) and enters the IF IC (IC12). The signal is converted to the second IF signal of 455 kHz by the second local oscillator and upper hetero, and detected to produce an audio signal.

CIRCUIT DESCRIPTION

■ Sub VHF receiver

The signal divided from the main VHF receiver circuit enters the RF amplifier (Q49). The amplified signal goes to the mixer (Q48). The frequency of the signal is converted by the first local oscillator generated by dividing the UHF VCO oscillator frequency by two by the prescaler (IC17) and the upper hetero to produce a first IF signal of 45.05 MHz. The signal passes through the MCF (XF1) and enters the IF IC (IC12). The signal is converted to the second IF signal of 455 kHz by the second local oscillator and upper hetero, and detected to produce an audio signal.

■ Audio Circuit

The detected VHF and UHF audio signal passes through the balance control circuit (Q522, Q523, Q525, and Q526), is mixed, passes through the buffer amplifier (IC517) and de-emphasized by Q520. The signal passes through the AF mute (Q539) and variable resistor, is mixed with the beep DTMF signal and goes to the AF amplifier (IC500). The amplified signal is fed to the speaker.

The detected VHF and UHF audio signal is switched by the AF SW (IC513) and used as a 1200bps packet signal, 9600bps packet signal, high-speed FM mode SSTV signal and CTCSS decode signal.

The 1200bps packet signal is amplified by the AF amplifier (IC514), passes through the audio filter (Q527), rectified to a rectangular wave by the comparator (IC512), goes to the TNC ASIC (IC510), passes through the filter (Q524, Q528, IC515), returns to IC510, converted to digital data and output to the PC pin from the TNC CPU (IC511). The 9600bps packet signal is amplified by the AF amplifier (IC514), passes through the audio filter (Q529), rectified to a rectangular wave by the comparator (IC512), goes to the TNC ASIC (IC510), converted to digital data and output to the PC pin from TNC CPU (IC511). The high-speed SSTV signal is amplified by the AF amplifier (IC506), switched by Q532 and output to the external SP terminal without passing through the audio amplifier. The CTCSS decode signal passes through the CR LPF and enters the CTCSS decoder (IC509).

3. Transmitter system

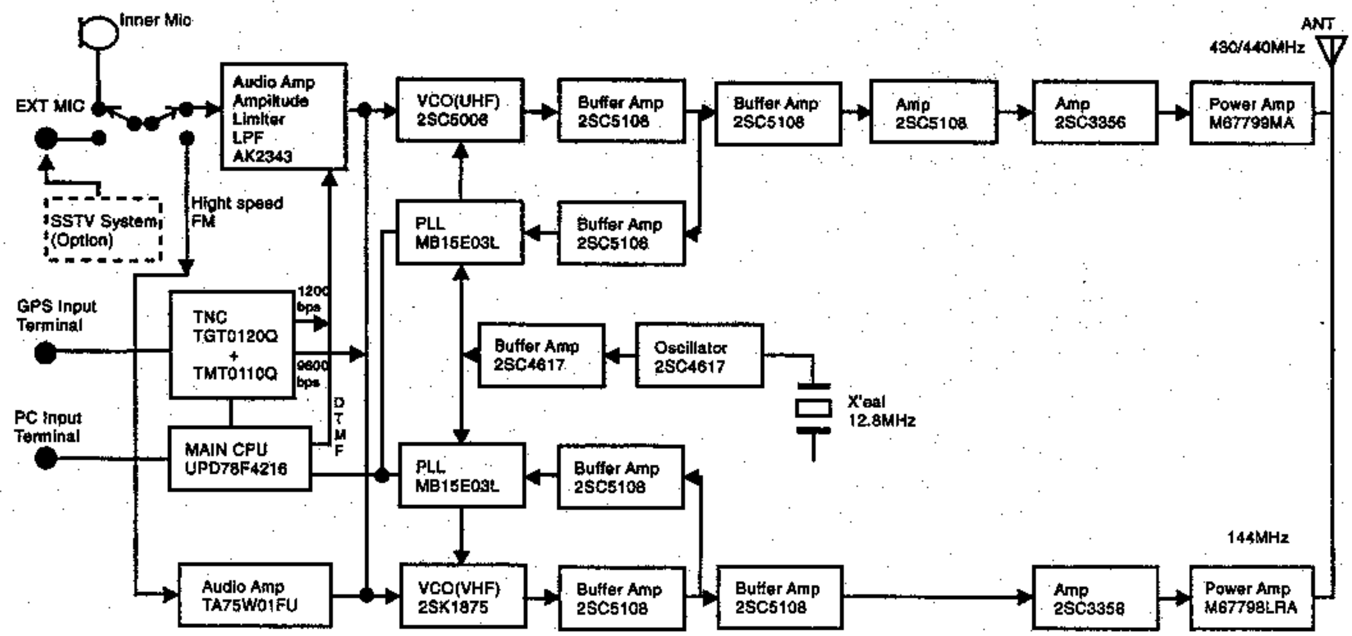


Fig.2 Transmitter Block Diagram

CIRCUIT DESCRIPTION

■ Modulator Circuit

The audio modulation input is switched between the internal microphone and the external microphone via the external microphone terminal. The baseband is processed by the microphone amplifier/preemphasis/limiter (IC509), mixed with the DTMF subtone, and adjusted by VR1 and VR2. The modulation signal is input to each VCO of VHF and UHF. The high-speed FM mode SSTV transmit signal input from the external microphone terminal is switched by Q517, amplified by AF amplifier (IC506), and adjusted directly by VR1 and VR2. The modulation signal is input to each VCO of VHF and UHF. The 1200bps packet signal is produced according to data input from the PC pin by the TNC CPU (IC511) and TNC ASIC (IC510). It is limited by IC509, adjusted by VR1 and VR2, and the modulation signal is input to each VCO of VHF and UHF. The 9600bps packet signal is produced according to data input from the PC pin by TNC CPU (IC511) and TNC ASIC (IC510). The signal is adjusted directly by VR1 and VR2, and the modulation signal is input to each VCO of VHF and UHF.

■ Transmitter circuit

The VHF VCO output is amplified by the RF amplifier (Q28) and driver amplifier (Q46), and finally by the power module (IC16). The signal passes through antenna switch (D30), LPF, and the duplexer consisting of LC, and is fed to the antenna. The UHF VCO output is amplified by the RF amplifier (Q23) and driver amplifier (Q36 and Q37), and finally by the power module (IC15). The signal passes through antenna switch (D20), LPF, and the duplexer consisting of LC, and is fed to the antenna.

■ APC circuit

The APC circuit detects the drain current of the power module and controls transmission output to provide stable transmission output. The voltage generated by R10, R11, and R13 is amplified, and the difference between this voltage and the reference voltage output of each band power from the CPU (IC505) is detected by IC2 to produce the APC voltage. This voltage is used to control the control terminal of the power module.

■ Temperature protection circuit

To prevent thermal destruction of the power module, the voltage of the thermistor located near the power module is monitored by the CPU (IC505). If it exceeds about 80°C, the APC voltage is reduced to suppress heating.

4. PLL circuit

■ Reference oscillator circuit

The 12.8MHz signal is generated by the Q60 oscillator circuit and supplied to the two PLL ICs through the buffer amplifier (Q18). Each PLL divides this frequency to produce a reference frequency of 5 kHz or 6.25 kHz. The 12.8MHz signal is tripled by Q30 and used for the second local oscillator for the VHF band.

■ Phase comparison

Part of the VHF VCO output is amplified by Q27, and input to VHF PLL IC (IC9). Part of the UHF VCO output is amplified by Q22, and input to the UHF PLL IC (IC6). The pulse-swallow type PLL IC divides the input VCO oscillator frequency using the data from the CPU (IC505), compares its phase with the phase of the reference frequency to implement the PLL synthesizer with the desired step.

■ Lock voltage (VCO control voltage)

The result of the phase comparison by the PLL IC is output as a phase difference. This pulse is amplified by a charge pump (Q19 and Q20, or Q24 and Q25), ripples are removed by a LPF, and it is supplied as the oscillator frequency control voltage for each VCO. About 7 V doubled by the DC/DC converter (IC3) is used for the charge pump power supply to widen the control voltage range.

■ Unlock detection circuit

When the PLL is unlocked, a low signal is output from the PLL IC pin 14. This signal is detected by the CPU (IC505) to control the transmission/reception switching timing.

■ VHF VCO

The desired frequency is generated directly by a colpitts oscillation circuit consisting of a FET (Q55). The oscillation frequency is varied by applying the frequency control voltage to the varicap (D37 and D38). The gate of the shift switch (Q59) goes high and Q56 turns off during reception to change the oscillation frequency. The modulation signal is applied to D36 to modulate the oscillation frequency.

■ UHF VCO (X58-460 sub unit)

The desired frequency is generated directly by a colpitts oscillation circuit consisting of a bipolar transistor Q2. The oscillation frequency is varied by applying the frequency control voltage to the varicap (D2 and D3). The gate of the shift switch Q58(X57-570) goes high and Q3 turns off during reception to change the oscillation frequency. The modulation signal is applied to D1 to modulate the oscillation frequency.

CIRCUIT DESCRIPTION

5. Power supply circuit

■ Ni-Cd charging circuit

The constant-current circuit consisting of Q6 and D5 supplies the constant current of about 70 mA to the Ni-Cd battery from the external power supply connected to the DC-IN terminal. The voltage supplied from the battery terminal or the DC-IN terminal is directed to each circuit by the power supply switching circuit.

6. Microcomputers and peripheral circuits

■ Reset and backup circuits

The CPU reset signal is generated with the CR time constant by detecting a rising edge of the M3 line voltage with the voltage detection IC (IC504). The TNC reset signal is generated by Q531 at a rising edge of MDMV. When the voltage supplied to the set decreases and the M3 line voltage falls below the detection voltage of the voltage detection IC (IC503), the CPU (IC505) detects it through the interrupt pin, backs up data in the EEPROM (IC501), and shuts the power off.

■ Voltage detection processing

The voltages are measured through the A/D port of the CPU (IC505) for processing. The battery voltage is input through a resistor, the battery meter during transmission and a warning sound is made when an abnormal power supply voltage (17.5 to 22.0 V) is applied. The squelch voltage is input from the IF IC, and a change in the noise voltage is detected to control squelch. The S meter voltage is input from the IF IC to control the S meter display. The thermistor voltage (temperature) is detected and the remote control microphone key operation is detected through the A/D port.

■ Battery save

The battery power is saved by controlling Q7 and Q10 through the SAVE port.

■ LED drive circuit

LEDs are turned on to illuminate the LCD and keys by controlling Q534. The ON AIR/BUSY LED is directly controlled via the open drain port of the CPU (IC505).

■ Key/encoder input circuit

The PWR key is assigned to the interrupt port. The other keys and destination diodes form a 6x6 matrix. Pressing a key is detected by scanning the matrix by software. The encoder uses the interrupt port for reading.

■ CTCSS

The encode signal is output from the D/A port of the CPU (IC505) by software. The signal level is adjusted and the resulting signal is mixed with the modulation signal. The CPU (IC505) detects that the specified tone frequency (low level) is detected by the decoder (IC509) through the SDO pin and controls muting.

■ DTMF

The DTMF signal is output from the D/A port of the CPU (IC505) by software means. The signal level is adjusted and the resulting signal is mixed with the modulation signal and goes to the baseband IC (IC509).

■ Serial control

The CPU (IC505) controls the TNC CPU (IC511) through 9600bps serial communication. In the APRS/"navi-tra" mode, the settings and transmission data are sent from the CPU to the TNC and received packet data is sent from the TNC to the CPU. In the packet transmission mode, the personal computer is connected through the RS-232C driver (IC516) from the CPU (IC505). The data from the personal computer is received by the CPU (IC505) and transferred to the TNC CPU. The received packet data is sent from the TNC CPU to the CPU, which transfers it to the personal computer as it is. In the personal computer control mode, data from the personal computer is received, processed, and returned by the CPU.

DESCRIPTION OF COMPONENTS

(X57-570X-XX)

Ref. No.	DESCRIPTION NAME	Use/function
IC1,2	IC	APC circuit
IC3	IC	Double voltage DC-DC converter
IC4	IC	Shift register power supply switching
IC6	IC	UHF PLL
IC7	IC	UHF PLL speedup switch
IC9	IC	VHF PLL
IC10	IC	VHF PLL speedup switch
IC12	IC	UHF IF
IC13	IC	VHF IF
IC14	IC	VHF AM/FM switching analog switch
IC15	IC	POWER MODULE : UHF
IC16	IC	POWER MODULE : VHF
IC17	IC	Sub VHF VCO1/2 divider
IC18	IC	VHF helical tuning voltage amplifier
IC500	IC	AF amplifier
IC501	IC	EEPROM setting, memory
IC503	IC	Reset
IC504	IC	Domestic CPU
IC505	IC	International CPU
IC506	IC	High-speed FM mode SSTV transmit/ receive signal amplifier
IC507	IC	M3 line AVR
IC508	IC	TNC AVR
IC509	IC	Baseband, CTCSS decoder
IC510	IC	TNC ASIC
IC511	IC	TNC CPU
IC512	IC	FSK/GMSK receive waveform rectification comparator
IC513	IC	Analog switch for detection output switching
IC514	IC	FSK/GMSK receieve signal amplifier
IC515	IC	FSK receive signal amplifier
IC516	IC	EEPROM memory
IC517	IC	Audio amplifier
IC518	IC	RS-232C driver
Q1	TRANSISTOR	APC circuit
Q2	FET	APC circuit switch
Q3	TRANSISTOR	APC circuit switch
Q4	TRANSISTOR	APC circuit output
Q5	FET	APC circuit shutdown
Q6	TRANSISTOR	Ni-Cd battery recharging circuit
Q7,8	TRANSISTOR	T4V AVR
Q9,10	TRANSISTOR	C3V AVR
Q11	TRANSISTOR	TV43 switch
Q12	TRANSISTOR	TV14 switch
Q13	TRANSISTOR	RV40 RVS 14 switch
Q14	TRANSISTOR	RV43 RVS 43 switch
Q15	TRANSISTOR	RV14 RVAM switch
Q16	TRANSISTOR	FM14 FM43 switch
Q17	TRANSISTOR	CV43 CV14 switch
Q18	TRANSISTOR	Reference oscillation buffer amplifier
Q19,20	TRANSISTOR	UHF PLL charge pump
Q21	TRANSISTOR	UHF PLL ripple filter
Q22,23	TRANSISTOR	UHF PLL buffer amplifier
Q24,25	TRANSISTOR	VHF PLL charge pump
Q26	TRANSISTOR	VHF PLL ripple filter
Q27,28	TRANSISTOR	VHF PLL buffer amplifier
Q29	TRANSISTOR	UHF IF amplifier
Q30	TRANSISTOR	VHF second local oscillator doubling circuit
Q31	TRANSISTOR	VHF IF amplifier
Q32~34	TRANSISTOR	AM detection circuit
Q35	TRANSISTOR	AM AGC circuit
Q36,37	TRANSISTOR	UHF transmission drive amplifier
Q38	FET	UHF mixer switch
Q39	FET	UHF mixer
Q40	FET	UHF receive RF amplifier
Q45	FET	APC voltage shutdown switch
Q46	TRANSISTOR	VHF transmission driver amplifier
Q47	TRANSISTOR	Sub VHF mixer switch
Q48	FET	Sub VHF mixer
Q49	FET	Sub VHF receive RF amplifier
Q50	FET	VHF mixer
Q51	TRANSISTOR	VHF mixer switch
Q52	TRANSISTOR	AGC voltage supply
Q53	FET	VHF receive RF amplifier
Q54	TRANSISTOR	VHF VCO buffer amplifier
Q55	FET	VHF VCO oscillation
Q56	TRANSISTOR	VHF VCO frequency shift
Q57	FET	T4V switch
Q58	FET	UHF VCO shift switch
Q59	FET	VHF VCO shift switch
Q60	TRANSISTOR	Reference oscillator circuit
Q61	FET	VHF narrow modulation switch (E)
Q62,63	FET	AIP reception
Q504	FET	AF mute switch
Q510,512	TRANSISTOR	AF amplifier AVR
Q511,513	TRANSISTOR	LED AVR
Q514	FET	AF amplifier AVR
Q515	FET	AF amplifier AVR switch
Q516	FET	M3SV switch
Q517	FET	High-speed FM mode transmission switch
Q518	FET	High-speed FM mode switch
Q519	FET	Microphone mute switch
Q520	TRANSISTOR	Deemphasis circuit
Q521	TRANSISTOR	TNC AVR switch
Q522,523	FET	Balance circuit
Q524	TRANSISTOR	FSK reception filter
Q525,526	FET	Balance circuit
Q527,528	TRANSISTOR	FSK reception filter
Q529	TRANSISTOR	GMSK reception filter
Q530	FET	Modulation band switch
Q531	FET	TNC reset
Q532	FET	High-speed FM mode reception switch
Q533	FET	High-speed FM mode reception switch
Q534	FET	Illumination LED switch
Q535	FET	M3 switch

DESCRIPTION OF COMPONENTS

Ref. No.	DESCRIPTION NAME	Use/function
Q536	TRANSISTOR	Beat shift circuit
Q537	FET	M3SV switch
Q538	TRANSISTOR	Illumination LED switch
Q539	FET	AF mute switch
D1	DIODE	APC voltage supply
D2	ZENER DIODE	APC voltage control
D3	DIODE	Prevent reverse connection of external power supply.
D4,5	DIODE	Constant-current circuit for Ni-Cd recharging
D6	DIODE	Double voltage DC-DC converter
D8	DIODE	UHF charge pump circuit
D9	DIODE	UHF PLL ripple filter
D10	DIODE	VCO output switch for UHF transmission
D11	DIODE	VCO output switch for main UHF reception
D12	DIODE	VCO output switch for sub VHF reception
D13	DIODE	VHF charge pump circuit
D14	DIODE	VHF PLL ripple filter
D15	DIODE	VCO output switch for VHF transmission
D17	DIODE	VCO output switch for main VHF reception
D18	DIODE	AM detection circuit
D19	DIODE	UHF drive amplifier bias
D20	DIODE	UHF transmission antenna switch \ (signal line)
D21,22	DIODE	UHF transmission antenna switch (receiver circuit protection)
D23	DIODE	Main UHF mixer switch OR
D24~26	DIODE	UHF band in/out switch
D27,28	VARIABLE CAPACITANCE DIODE	Filter tuning outside UHF band
D29	DIODE	VHF drive amplifier bias
D30	DIODE	VHF transmission antenna switch (signal line)
D31	DIODE	VHF transmission antenna switch (receiver circuit protection)
D32-34	VARIABLE CAPACITANCE DIODE	VHF helical tuning
D36	VARIABLE CAPACITANCE DIODE	VHF VCO modulation
D37,38	VARIABLE CAPACITANCE DIODE	VHF VCO control
D40	DIODE	UHF RF amplifier switch OR
D42	DIODE	UHF band in/out switch
D43	DIODE	UHF MAIN/SUB switch
D44	DIODE	
D500,501	DIODE	Key matrix
D502,503	DIODE	Destination
D506	DIODE	Key matrix
D507,508	DIODE	Destination
D509,510	LED	Key illumination yellow
D511	LED	LCD illumination YG
D512	LED	A band TX/BUSY
D513	LED	B band TX/BUSY

Ref. No.	DESCRIPTION NAME	Use/function
D514,515	LED	Key illumination yellow
D516	DIODE	Key matrix
D517	DIODE	
D518	LED	LCD illumination YG
D526	DIODE	AF mute time constant
D527	ZENER DIODE	AF amp AVR reference voltage
D528	ZENER DIODE	LED AVR reference voltage
D529	DIODE	M3 line electric charge loss prevention
D530	ZENER DIODE	PTT line overvoltage input protection
D531	DIODE	AF amplifier AVR reference voltage
D532	LED	LCD illumination YG
D533,534	DIODE	AF mute switch OR
D535	LED	LCD illumination YG
D536-539	LED	Key illumination yellow

(X58-460X-XX)

Ref. No.	DESCRIPTION NAME	Use/function
D1	DIODE	Modulation
D2,3	VARIABLE CAPACITANCE DIODE	Oscillation frequency control
Q1	TRANSISTOR	VCO output buffer amplifier
Q2	TRANSISTOR	VCO oscillation
Q3	TRANSISTOR	Oscillation frequency shift switch

SEMICONDUCTOR DATA

Microcomputer pin functions : µPD78F4216 (IC505)

■ Terminal function

Pin No.	I/O	Pin name	Active level	Function
1	O	APCG	H	APC circuit power H:ON
2	I	LD43	H	430MHz PLL lock detect H:LOCK
3	O	SAVE	L	Save power supply (C3) L:ON
4	O	DS	_⊓_⊓_	Shift register data output pin
5	O	T43	H	430MHz transmission power supply H:ON
6	O	EP43	_⊓_	430MHz PLL enable H:Enable
7	O	T14	H	144MHz transmission power supply H:ON
8	O	SH43	-	430MHz VCO switch L:RX
9	-	-	-	Positive power
10	O	-	-	System clock
11	I	-	-	System clock
12	-	-	-	Ground
13	-	-	-	Open
14	-	-	-	Connect to VSS
15	I	RST	H	System reset L:Reset 2.5V
16	I	INT	↓	Power supply voltage drop detection interrupt 3.2V
17	O	EP14	_⊓_	118, 144MHz PLL enable H:Enable
18	O	SH14	-	144MHz VCO switch H:RX
19	I	EN1	↓↑	Encoder interrupt
20	I	EN2	_⊓_⊓_	Encoder data input
21	I	PWR	↓	[PWR] switch interrupt L: Pressed
22	O	PS	L	Transceiver main power (M3VS) switch L:ON
23,24	-	-	-	Connect to VDD
25	I	BATT	-	Battery voltage level A/D input
26	I	SQ14	-	Noise level A/D input (VHF IF)
27	I	SM14	-	S meter level A/D input (VHF IF)
28	I	PTP	-	Temperature-compensated thermistor voltage A/D input
29	I	REM	-	Remote control microphone key A/D input
30	I	SQ43	-	Noise level A/D input (UHF IF)
31	I	SM43	-	S meter level A/D input (UHF IF)
32	I	LD14	H	144MHz PLL lock detect H:Lock
33	-	-	-	Connect to VSS
34	O	BEEP/DTMF	∿	Beep, DTMF tone, 1750Hz tone D/A output
35	O	TONE	∿	Subtone D/A output
36	-	-	-	Connect to VDD
37	I	RxD2	L	UART data input from PC pin
38	O	TxD2	L	UART data output to PC pin
39	O	AFS	-	Tone detection line AF switch H:VHF
40	I	RxD1	L	UART data input from internal TNC (TNC HOSTTX)
41	O	TxD1	L	UART data output to internal TNC (TNC HOSTRX)
42	O	TNCB	-	TNC demodulation line switch H:VHF
43	O	SSTVB	-	High-speed SSTV receive band switch H:VHF
44	O	AOLCD	-	LCD driver data type bit L: Control; H: Display
45	O	ELCD	_⊓_	LCD driver enable H: Enable
46	O	RWLCD	-	LCD driver read/write L: Write
47	O	RESLCD	H	LCD driver reset L: Reset
48-55	I/O	D0 ~ 7	-	LCD driver data line
56	I	KEYI1	L	Key matrix input 1
57	I	KEYI2	L	Key matrix input 2
58	I	KEYI3	L	Key matrix input 3
59	I	KEYI4	L	Key matrix input 4
60	I	KEYI5	L	Key matrix input 5
61	I	TYPE	L	Destination, channel display mode diode input
62	I	PKS	L	Packet standby modem transmission request H: Transmission
63	I	PTT	L	[PTT] key input L: Pressed
64-68	O	KEY01-05	L	Key matrix output 1-5
69	O	LAMP	H	Key, LCD illumination, TX/BUSY lamp power supply H:ON
70	O	MODEM	H	AX.25 modem power switch H:ON
71	O	SQLOUT	L	TNC squelch signal L:BUSY
72	-	-	-	Ground
73	I	CONLED	L	Packet transmission connect detection L: Connect
74	I	STALED	L	Packet transmission standby detection L: Standby
75	I	GPSLED	H	GPS receiver receive status L: No measurement; H: Measurement
76	O	AFAT43	H	AF43 line attenuation switch H:ATT ON
77	O	AFAT14	H	AF14 line attenuation switch H:ATT ON
78	O	AFM43	L	AF43 mute switch L:MUTE
79	O	AFM14	L	AF14 mute switch L:MUTE
80	O	AFC	L	Audio amplifier power supply L:ON
81	-	-	-	Positive power supply
82	O	SSTVH	L	High-speed SSTV microphone amplifier bus L: High speed
83	O	BP14	-	144MHz band bus tuning PWM output
84	O	BP43	-	430MHz band bus tuning PWM output

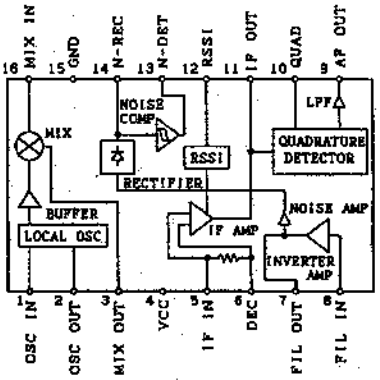
SEMICONDUCTOR DATA

Pin No.	I/O	Pin name	Active level	unction
85	O	APC	-	APC PWM output
86	O	DTMFM	L	DTMF, packet modulation line mute L:MUTE
87	I	SDO	L	AK2343 tone match detection L: Match
88	O	ET	⎍	AK2343 enable H:Enable
89	O	CLK	⎍⎍	Common clock line
90	O	DATA	⎍⎍	Common data line
91	I	SI	⎍⎍	EEPROM data input line (EEPROM SO pin)
92	O	CS1	‾_/‾	EEPROM1 chip select L:Enable

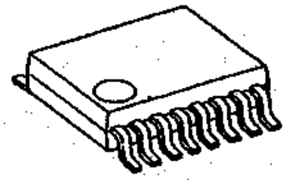
Pin No.	I/O	Pin name	Active level	Function
93	O	CS2	‾_/‾	EEPROM2 chip select L:Enable
94	I	VPP	pulse	Flash write 10V application pin Normally low
95	O	TLEDA	L	A band transmission LED L: ON
96	O	RLEDA	L	A band busy LED L: ON
97	O	TLEDB	L	B band transmission LED L: ON
98	O	RLEDB	L	B band busy LED L: ON
99	O	SU14	H	PLL speedup (interval: 4 ms or less) H:SU
100	O	SU43	H	PLL speedup (interval: 4 ms or less) H:SU

FM IF DETECTOR : TA31136FN (IC12, 13)

■ Block diagram



■ External view



■ Pin Function

Pin No.	Pin Name	Function
1	OSC IN	Local oscillator input and output terminals. Colpitts oscillator is formed by internal emiter follower and external X'tal. And external injection is possible from pin 2 or pin 1.
2	OSC OUT	
3	MIX OUT	MIX output terminal. Output impedance is around 1.8kΩ.
4	Vcc	Power supply
5	IF IN	2nd IF input and decoupling for bias.
6	DEC	Input impedance is around 1.8kΩ.
7	FIL OUT	INVERTER AMP input and output terminals. BPF is composed of external capacitors and resistors. Connected internally to rectifier circuit by coupling capacitor.
8	FIL IN	
9	AF OUT	Demodulate signal output terminal. Carrier leak is small as LPF is built-in. output impedance is around 360Ω.

Pin No.	Pin Name	Function
10	QUAD	Phase shift signal input terminal of FM demodulator.
11	IF OUT	Output terminal of IF AMP.
12	RSSI	This terminal outputs DC level according to input signal level to IF AMP. Dynamic range is around 70dB.
13	N-DET	The result of noise detection is output by comparing output voltage of N-REC terminal with internal refrence. Hysteresis range is about 100mV and output is open collector.
14	N-REC	After output of INVERTER AMP amplified around 20dB, noise signal is rectified by external capacitor.
15	GND	GND terminal.
16	MIX IN	1st IF signal input terminal. Input impedance is around 4kΩ at 21.7MHz.

TERMINAL FUNCTION

Connector No.	Terminal No.	Terminal name	Terminal function
CN1 ↕ CN504	1	GND	GND
	2	GND	GND
	3	SH14	VHF VCO shift control
	4	SQ14	VHF squelch voltage
	5	MD14	VHF modulation signal
	6	SU14	VHF PLL speedup control
	7	LD14	VHF PLL lock signal
	8	EP14	VHF PLL data enable signal
	9	PTP	Final power module temperature detection voltage
	10	SM14	VHF S meter voltage
	11	AF43	UHF detection audio signal
	12	SM43	UHF S meter voltage
	13	SQ43	UHF squelch voltage
	14	C3V	Common power supplies
	15	MD43	UHF modulation signal
	16	SH43	UHF VCO shift control
	17	SU43	UHF PLL speedup control
	18	DATA	PLL data (common data line)
	19	EP43	UHF PLL data enable signal
	20	LD43	UHF PLL lock signal
	21	AF14	VHF detection audio signal
	22	BP14	VHF helical tuning signal
	23	NC	NC
	24	CLK	PLL clock, shift register clock (common clock line)
	25	DS1	Shift register data
	26	T14	VHF transmission power supply
	27	BP43	Reception filter tuning signal outside the UHF band
	28	T43	UHF transmission power supply
	29	GND	GND
	30	APC	Transmission output control signal
	31	GND	GND
	32	APCG	APC circuit ON/OFF control
	33	B	Power supply
	34	B	Power supply
	35	SAVE	Battery save control
	36	M3S	AVR reference voltage

PARTS LIST

* New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L: Scandinavia K: USA P: Canada
Y: PX (Far East, Hawaii) T: England E: Europe
Y: AAFES (Europe) X: Australia M: Other Areas

TH-D7A/E

TX-RX UNIT (X57-570X-XX)

Ref. No.	Adress	New parts	Parts No.	Description	Destination
TH-D7A/E (Y50-483)					
1	1B	*	A02-2356-13	CABINET ASSY(FRONT)	
2	1A	*	A62-0624-03	PANEL ASSY (TOP)	
3	1B		B09-0362-03	CAP (DC IN)	
4	1A	*	B09-0397-03	CAP (MIC/SP/PC/GPS)	
5	1A	*	B10-2537-13	FRONT GLASS	
6	2A	*	B11-1210-02	ILLUMINATION GUIDE(LCD)	
7	2A	*	B38-0805-05	LCD ASSY	
8	-		B46-0310-03	WARRANTY CARD ACSY	E
8	-		B46-0410-40	WARRANTY CARD ACSY	K
10	-	*	B62-1004-00	INSTRUCTION MANUAL(ENG) ACSY	
11	-	*	B62-1076-00	INSTRUCTION MANUAL(SPA) ACSY	
13	3A		E04-0407-05	RF COAXIAL RECEPTACLE(SMA)	
14	2A		E23-0904-05	TERMINAL (ANT)	
15	2B		E23-1042-14	TERMINAL (BATTERY)	
16	2A	*	E23-1123-04	GROUND TERMINAL(CONT-RF)	
17	2B		E37-0681-05	FLAT CABLE	
20	-	*	E30-3374-05	CABLE WITH 2.5D PLUG	
18	2A		F10-2251-04	SHIELDING COVER(P MODULE)	
19	2A	*	F10-2266-03	SHIELDING COVER(RF)	
21	1B		G01-0891-04	COIL SPRING (RELEASE)	
22	2B	*	G11-2569-04	SHEET (PTT)	
23	2A		G13-1460-04	CUSHION (VOL/ENC)	
24	2B		G13-1664-04	CUSHION (RF SHIELD)	
25	3A	*	G53-0843-02	PACKING (CABINET)	
26	2A	*	G53-0844-03	PACKING (SP/MIC)	
27	-	*	H12-3038-01	PACKING FIXTURE	
28	-		H25-0085-04	PROTECTION BAG (100/200/0.07)	
29	-	*	H52-1199-02	ITEM CARTON CASE	K
29	-	*	H52-1264-02	ITEM CARTON CASE	E
31	2B		J19-1599-03	HOLDER (BATT TERMINAL)	
32	1B		J19-5302-04	HOLDER (RELEASE)	
33	2B	*	J21-8362-04	HARDWARE FIXTURE(PTT)	
34	1B	*	J21-8363-04	HARDWARE FIXTURE(BOTTAM)	
35	-		J29-0631-13	HOOK ACSY	
36	-		J69-0342-05	HANDSTRAP ACSY	
37	1B		K29-5165-03	LEVER KNOB (RELEASE)	
38	1A	*	K29-5256-02	BUTTON KNOB(PTT)	
39	1A	*	K29-5257-03	KNOB (VOL)	
40	1B	*	K29-5258-01	KEY TOP	
41	1A	*	K29-5259-03	KNOB (ENC)	
A	2A		N09-1492-05	PAN HEAD SCREW (SMA)	
B	1A		N14-0573-04	CIRCULAR NUT(SMA)	
C	2A		N30-2605-46	PAN HEAD MACHINE SCREW(P MODUL	
D	3B		N80-2012-45	PAN HEAD TAPTITE SCREW(CABINET	
E	2B		N83-2005-46	PAN HEAD TAPTITE SCREW	
SP	1A		T07-0266-05	SPEAKER	
ANT	-		T90-0634-05	WHIP ANTENNA ACSY	
42	-		W08-0437-05	CHARGER(120V 13.5V) ACSY	K
42	-		W08-0440-05	CHARGER(230V 13.5V) ACSY	E
BATT	-		W09-0909-05	BATTERY ASSY(6V 650mAh) ACSY	E
BATT	-		W09-0911-05	BATTERY ASSY(9.6V 600mAh) ACSY	K
TX-RX UNIT (X57-570X-XX) 0-11:K, 2-71:E					
C1			CK73HB1H471K	CHIP C 470PF K	
C2			CK73GB1H471K	CHIP C 470PF K	
C3 -5			CK73HB1H471K	CHIP C 470PF K	
C6			CK73GB1H471K	CHIP C 470PF K	
C7 ,8			CK73HB1H471K	CHIP C 470PF K	
C9			CK73GB1H102K	CHIP C 1000PF K	
C10 ,11			CK73HB1H471K	CHIP C 470PF K	
C12			CK73GB1H102K	CHIP C 1000PF K	
C13			CK73GB1C104K	CHIP C 0.10UF K	
C14			CK73HB1H102K	CHIP C 1000PF K	
C15			CK73GB1C104K	CHIP C 0.10UF K	
C16			CK73GB1H102K	CHIP C 1000PF K	
C17			CK73GB1H471K	CHIP C 470PF K	
C18			CK73GB1H102K	CHIP C 1000PF K	
C19			CK73GB1E103K	CHIP C 0.010UF K	
C20			CK73GB1H102K	CHIP C 1000PF K	
C21			CK73HB1H102K	CHIP C 1000PF K	
C22			CK73HB1H471K	CHIP C 470PF K	
C23			CK73GB1H102K	CHIP C 1000PF K	
C24			CK73HB1H471K	CHIP C 470PF K	
C25			CK73GB1H102K	CHIP C 1000PF K	
C26 -28			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C29			CK73GB1H471K	CHIP C 470PF K	
C30			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C31			CK73HB1H102K	CHIP C 1000PF K	
C32			CK73HB1H471K	CHIP C 470PF K	
C33 -35			CK73FB1A105K	CHIP C 1.0UF K	
C36 ,37			CK73GB1C104K	CHIP C 0.10UF K	
C38 -41			CK73HB1H471K	CHIP C 470PF K	
C42			CK73GB1C104K	CHIP C 0.10UF K	
C43			CK73GB1H471K	CHIP C 470PF K	
C44 ,45			CK73HB1H471K	CHIP C 470PF K	
C46			CK73GB1H471K	CHIP C 470PF K	
C47			CK73GB1C104K	CHIP C 0.10UF K	
C48		*	CK73HB1A104K	CHIP C 0.10UF K	
C49			CK73FB1A105K	CHIP C 1.0UF K	
C50		*	CC73HCH1E181J	CHIP C 180PF J	
C51			CK73GB1H471K	CHIP C 470PF K	
C52			CK73HB1H102K	CHIP C 1000PF K	
C53			CC73HCH1H070D	CHIP C 7.0PF D	
C54			CC73HCH1H390J	CHIP C 39PF J	
C55			CC73HCH1H220J	CHIP C 22PF J	
C56 ,57			CK73HB1H102K	CHIP C 1000PF K	
C58			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C59 ,60			CK73HB1H471K	CHIP C 470PF K	
C65			C92-0518-05	CHIP-TAN 0.22UF 20WV	
C66			CK73HB1H471K	CHIP C 470PF K	
C67			C92-0694-05	TAN C 10UF 16WV	
C68			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C69		*	C92-0715-05	TAN C 0.33UF 20WV	
C70			CK73HB1H471K	CHIP C 470PF K	
C71			CC73HCH1H020C	CHIP C 2.0PF C	
C72 ,73			CK73HB1H471K	CHIP C 470PF K	

PARTS LIST

TX-RX UNIT (X57-570X-XX)

Ref. No.	Adress	New parts	Parts No.	Description	Destination
C74			CC73HCH1H060D	CHIP C 6.0PF D	
C75			CC73HCH1H080D	CHIP C 8.0PF D	
C76			CK73HB1H471K	CHIP C 470PF K	
C78			CK73HB1H471K	CHIP C 470PF K	
C79			CC73HCH1H060D	CHIP C 6.0PF D	
C80			CC73HCH1H100D	CHIP C 10PF D	
C81			CC73HCH1H060D	CHIP C 6.0PF D	
C82			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C83,84			CK73HB1H102K	CHIP C 1000PF K	
C89			C92-0518-05	CHIP-TAN 0.22UF 20WV	
C90			CK73HB1H102K	CHIP C 1000PF K	
C91			C92-0694-05	TAN C 10UF 16WV	
C92			C92-0592-05	CHIP-TAN 4.7UF 6.3WV	
C93		*	C92-0715-05	TAN C 10UF 16WV	
C94-96			CK73HB1H102K	CHIP C 1000PF K	
C98			CK73HB1H102K	CHIP C 1000PF K	
C99			CC73HCH1H080D	CHIP C 8.0PF D	
C100			CK73HB1H102K	CHIP C 1000PF K	
C102			CK73HB1H102K	CHIP C 1000PF K	
C104			CC73HCH1H100D	CHIP C 10PF D	
C106			CC73HCH1H050C	CHIP C 5.0PF C	
C108			C92-0623-05	CHIP TAN 22UF 4WV	
C109			CC73HCH1H100D	CHIP C 10PF D	
C110			CK73GB1C104K	CHIP C 0.10UF K	
C112			CK73GB1C104K	CHIP C 0.10UF K	
C113			CK73HB1C103K	CHIP C 0.010UF K	
C114			CC73HCH1H101J	CHIP C 100PF J	
C115			CK73GB1C104K	CHIP C 0.10UF K	
C116,117			CC73HCH1H121J	CHIP C 120PF J	
C118			CC73HCH1E221J	CHIP C 220PF J	
C119			CK73GB1H472K	CHIP C 4700PF K	
C120			CC73HCH1H150J	CHIP C 15PF J	
C121			CC73HCH1H100D	CHIP C 10PF D	
C122			CK73GB1E103K	CHIP C 0.010UF K	
C123			CK73HB1H471K	CHIP C 470PF K	
C125			CC73GCH1H030C	CHIP C 3.0PF C	
C126			CC73GCH1H060D	CHIP C 6.0PF D	
C127			CK73GB1H102K	CHIP C 1000PF K	
C129			CK73HB1H471K	CHIP C 470PF K	
C131			CK73GB1E103K	CHIP C 0.010UF K	
C132			CK73HB1H102K	CHIP C 1000PF K	
C133			CC73HCH1H220J	CHIP C 22PF J	
C134			CK73HB1C103K	CHIP C 0.010UF K	
C135			CC73HCH1H050C	CHIP C 5.0PF C	
C136			CK73HB1H102K	CHIP C 1000PF K	
C137			CC73HCH1H270J	CHIP C 27PF J	
C138			C92-0623-05	CHIP TAN 22UF 4WV	
C139,140			CK73GB1C104K	CHIP C 0.10UF K	
C142			CK73HB1C103K	CHIP C 0.010UF K	
C143			CC73HCH1H101J	CHIP C 100PF J	
C144			CK73GB1C104K	CHIP C 0.10UF K	
C145,146			CC73HCH1H121J	CHIP C 120PF J	
C147			CC73HCH1E221J	CHIP C 220PF J	
C148			CK73HB1E472K	CHIP C 4700PF K	
C149			CC73HCH1H150J	CHIP C 15PF J	
C151			CK73GB1E103K	CHIP C 0.010UF K	
C152			CK73HB1H102K	CHIP C 1000PF K	
C153			CK73GB1E103K	CHIP C 0.010UF K	
C155			CK73HB1H102K	CHIP C 1000PF K	
C159			CK73HB1H102K	CHIP C 1000PF K	
C160			CC73HCH1H390J	CHIP C 39PF J	
C163-165		*	CK73HB1A104K	CHIP C 0.10UF K	
C166			CK73HB1H102K	CHIP C 1000PF K	
C167			CK73GB1C104K	CHIP C 0.10UF K	
C168		*	CK73HB1A104K	CHIP C 0.10UF K	
C169			CK73GB1C104K	CHIP C 0.10UF K	
C170			CK73HB1H102K	CHIP C 1000PF K	
C171			CK73HB1C103K	CHIP C 0.010UF K	
C172			CK73FB1A105K	CHIP C 1.0UF K	
C173			CK73GB1C104K	CHIP C 0.10UF K	
C174			CK73HB1H471K	CHIP C 470PF K	
C175			CC73HCH1H180J	CHIP C 18PF J	
C177			CK73HB1H471K	CHIP C 470PF K	
C179			CK73HB1H471K	CHIP C 470PF K	
C180			CC73HCH1H040C	CHIP C 4.0PF C	
C181,182			CK73HB1H471K	CHIP C 470PF K	
C184			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C185			CK73HB1H471K	CHIP C 470PF K	
C186			CC73HCH1H070D	CHIP C 7.0PF D	
C187			CK73HB1C103K	CHIP C 0.010UF K	
C188,189			CK73HB1H471K	CHIP C 470PF K	
C190			CK73GB1H471K	CHIP C 470PF K	
C192			CK73FB1C474K	CHIP C 0.47UF K	
C193			CK73HB1C103K	CHIP C 0.010UF K	
C194			CK73HB1H471K	CHIP C 470PF K	
C197			CK73GB1H471K	CHIP C 470PF K	
C198			CC73GCH1H060D	CHIP C 6.0PF D	
C199			CC73GCH1H040C	CHIP C 4.0PF C	
C200			CC73GCH1H010C	CHIP C 1.0PF C	
C201			CC73GCH1H050C	CHIP C 5.0PF C	
C202			CC73GCH1H100D	CHIP C 10PF D	
C203			CC73GCH1H030C	CHIP C 3.0PF C	
C204			CK73GB1H471K	CHIP C 470PF K	
C206			CC73GCH1H390J	CHIP C 39PF J	
C207			CC73GCH1H220J	CHIP C 22PF J	
C208			CC73GCH1H040C	CHIP C 4.0PF C	
C210			CC73HCH1H070D	CHIP C 7.0PF D	
C211			CK73GB1H102K	CHIP C 1000PF K	
C212			CK73HB1H471K	CHIP C 470PF K	
C213			CC73HCH1H180J	CHIP C 18PF J	
C214			CK73HB1H471K	CHIP C 470PF K	
C215			CC73HCH1H040C	CHIP C 4.0PF C	
C216			CK73HB1C103K	CHIP C 0.010UF K	
C217			CK73GB1H471K	CHIP C 470PF K	
C218			CK73HB1H471K	CHIP C 470PF K	
C219			CC73HCH1H030C	CHIP C 3.0PF C	
C220			CK73HB1H471K	CHIP C 470PF K	
C221			CK73GB1C104K	CHIP C 0.10UF K	
C222,223			CK73HB1H471K	CHIP C 470PF K	
C224			CC73HCH1H060D	CHIP C 6.0PF D	
C225			CC73HCH1H030C	CHIP C 3.0PF C	
C226,227			CK73HB1H471K	CHIP C 470PF K	
C228			CC73HCH1H220J	CHIP C 22PF J	
C229			CC73HCH1H0R5B	CHIP C 0.5PF B	
C230			CC73HCH1H220J	CHIP C 22PF J	
C231			CK73HB1H471K	CHIP C 470PF K	
C232			CC73HCH1H070D	CHIP C 7.0PF D	
C233			CK73HB1H471K	CHIP C 470PF K	
C234			CC73HCH1H090D	CHIP C 9.0PF D	
C235			CK73HB1H471K	CHIP C 470PF K	

PARTS LIST

TX-RX UNIT (X57-570X-XX

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
C236			CK73GB1C104K	CHIP C 0.10UF K	
C238			CK73HB1H471K	CHIP C 470PF K	
C239			CK73HB1H471K	CHIP C 470PF K E	
C262			CK73HB1H102K	CHIP C 1000PF K	
C263			CC73HCH1H330J	CHIP C 33PF J	
C264			CK73HB1H102K	CHIP C 1000PF K	
C265			CC73HCH1H080D	CHIP C 8.0PF D	
C266			CK73HB1H102K	CHIP C 1000PF K	
C267			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C268			CK73HB1H102K	CHIP C 1000PF K	
C269			CK73HB1C103K	CHIP C 0.010UF K	
C270			CK73HB1H102K	CHIP C 1000PF K	
C271,272			CC73HCH1H330J	CHIP C 33PF J	
C274			CK73HB1H102K	CHIP C 1000PF K	
C275			CK73FB1C474K	CHIP C 0.47UF K	
C276			CK73HB1C103K	CHIP C 0.010UF K	
C277			CK73HB1H102K	CHIP C 1000PF K	
C278			CC73HCH1H120J	CHIP C 12PF J	
C279			CK73HB1H102K	CHIP C 1000PF K	
C281			CC73GCH1H090D	CHIP C 9.0PF D	
C282			CC73GCH1H160J	CHIP C 16PF J	
C283			CC73GCH1H060D	CHIP C 6.0PF D	
C284			CC73GCH1H270J	CHIP C 27PF J	
C285			CK73GB1C104K	CHIP C 0.10UF K	
C286			CK73HB1H102K	CHIP C 1000PF K	
C288			CK73HB1H102K	CHIP C 1000PF K	
C290			CK73HB1H102K	CHIP C 1000PF K	
C292			CK73HB1H102K	CHIP C 1000PF K	
C293			CC73HCH1H050C	CHIP C 5.0PF C	
C294			CK73HB1H102K	CHIP C 1000PF K	
C295			CK73HB1C103K	CHIP C 0.010UF K	
C296			CC73HCH1H030C	CHIP C 3.0PF C	
C300,301			C92-0592-05	CHIP-TAN 4.7UF 6.3WV	
C302			CC73HCH1H090D	CHIP C 9.0PF D	
C303			CK73HB1H102K	CHIP C 1000PF K	
C304			CC73HCH1H090D	CHIP C 9.0PF D	
C306-309			CK73HB1H102K	CHIP C 1000PF K	
C310			CK73HB1C103K	CHIP C 0.010UF K	
C311			CC73HCH1H050C	CHIP C 5.0PF C	
C313			CK73HB1H102K	CHIP C 1000PF K	
C315		*	CC73HCH1H240J	CHIP C 24PF J	
C316			CK73HB1H102K	CHIP C 1000PF K	
C317			CK73GB1C104K	CHIP C 0.10UF K	
C319,320			CK73HB1H102K	CHIP C 1000PF K	
C321			CC73HCH1H150J	CHIP C 15PF J	
C322,323			CK73HB1H102K	CHIP C 1000PF K	
C324			CK73GB1H102K	CHIP C 1000PF K	
C325			CC73HCH1H270J	CHIP C 27PF J	
C328			CC73HCH1H470J	CHIP C 47PF J	
C329			CC73HCH1H060D	CHIP C 6.0PF D	
C330			CC73HCH1H330J	CHIP C 33PF J	
C331			CC73HCH1H390J	CHIP C 39PF J	
C332			CC73HCH1H330J	CHIP C 33PF J	
C333			CC73HCH1H390J	CHIP C 39PF J	
C335			CC73HCH1H050C	CHIP C 5.0PF C	
C336			CK73FB1A105K	CHIP C 1.0UF K	
C337,338			CK73GB1C104K	CHIP C 0.10UF K	
C339			CK73FB1A105K	CHIP C 1.0UF K	
C340			CK73GB1C104K	CHIP C 0.10UF K	
C342			CK73HB1H471K	CHIP C 470PF K	

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
C343			CC73GCH1H040C	CHIP C 4.0PF C	
C345			CK73GB1C104K	CHIP C 0.10UF K	
C347			CK73HB1C103K	CHIP C 0.010UF K	
C348,349			CK73HB1H102K	CHIP C 1000PF K	
C353			CC73GCH1H101J	CHIP C 100PF J	
C354			CC73GCH1H060D	CHIP C 6.0PF D	
C355			CC73GCH1H120J	CHIP C 12PF J	
C356			CC73GCH1H330J	CHIP C 33PF J	
C357			CC73GCH1H050C	CHIP C 5.0PF C	
C358			CC73GCH1H010C	CHIP C 1.0PF C	
C359			CC73GCH1H220J	CHIP C 22PF J	
C360			CC73GCH1H090D	CHIP C 9.0PF D	
C361			CC73GCH1H040C	CHIP C 4.0PF C	
C362			CC73GCH1H030C	CHIP C 3.0PF C	
C363			CC73GCH1H220J	CHIP C 22PF J	
C364			CC73GCH1H020C	CHIP C 2.0PF C	
C365			CC73GCH1H120J	CHIP C 12PF J	
C366			CC73HCH1H010C	CHIP C 1.0PF C	
C367			CC73HCH1H0R5B	CHIP C 0.5PF B	
C368			CK73HB1H102K	CHIP C 1000PF K	
C369			CK73GB1C104K	CHIP C 0.10UF K	
C370,371			CK73HB1H102K	CHIP C 1000PF K	
C372			CC73HCH1H100D	CHIP C 10PF D	
C373			CC73HCH1H090D	CHIP C 9.0PF D	
C374			CC73HCH1H0R5B	CHIP C 0.5PF B	
C375			CK73HB1C103K	CHIP C 0.010UF K	
C376-378			CK73HB1H102K	CHIP C 1000PF K	
C379		*	CK73HB1A104K	CHIP C 0.10UF K	
C380			CK73GB1C104K	CHIP C 0.10UF K	
C381			CC73HCH1H100D	CHIP C 10PF D	
C382			CK73HB1H471K	CHIP C 470PF K	
C384			CC73HCH1H030C	CHIP C 3.0PF C	
C385			CK73HB1C103K	CHIP C 0.010UF K	
C392			CK73HB1H471K	CHIP C 470PF K	
C393		*	CK73HB1A104K	CHIP C 0.10UF K	
C396			CK73HB1H471K	CHIP C 470PF K	
C397			CK73HB1C103K	CHIP C 0.010UF K	
C398			CC73HCH1H680J	CHIP C 68PF J	
C500			CK73HB1H471K	CHIP C 470PF K	
C503,504			CK73HB1H471K	CHIP C 470PF K	
C510			C92-0665-05	TANTAL 100UF 6.3WV	
C511-513			CK73HB1C103K	CHIP C 0.010UF K	
C516			CK73HB1H471K	CHIP C 470PF K	
C519			C92-0565-05	CHIP-TAN 6.8UF 10WV	
C520			CK73FB1A105K	CHIP C 1.0UF K	
C521		*	CK73HB1A473K	CHIP C 0.047UF K	
C522			C92-0628-05	CHIP-TAN 10UF 10WV	
C523			CK73GB1C104K	CHIP C 0.10UF K	
C524			CC73HCH1H101J	CHIP C 100PF J	
C525		*	CK73HB1A473K	CHIP C 0.047UF K	
C526			CK73HB1H102K	CHIP C 1000PF K	
C527		*	CK73HB1A473K	CHIP C 0.047UF K	
C528,529			CK73HB1C103K	CHIP C 0.010UF K	
C530,531			CK73HB1H471K	CHIP C 470PF K	
C532,533			CK73HB1C103K	CHIP C 0.010UF K	
C534			CK73FB1A105K	CHIP C 1.0UF K	
C535			CK73HB1H471K	CHIP C 470PF K	
C536			CK73GB1C104K	CHIP C 0.10UF K	
C537-541			CK73HB1H471K	CHIP C 470PF K	
C542		*	CK73HB1A104K	CHIP C 0.10UF K	

PARTS LIST

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Ref. No.	Adress	New parts	Parts No.	Description	Destination
C543			CK73HB1H102K	CHIP C 1000PF K	
C544,545			CK73HB1H471K	CHIP C 470PF K	
C546			CK73HB1C103K	CHIP C 0.010UF K	
C547			CC73HCH1H101J	CHIP C 100PF J	
C548		*	C92-0756-05	ELECTRO C 330UF 6.3WV	
C549			CK73FB1A105K	CHIP C 1.0UF K	
C550			CK73HB1C103K	CHIP C 0.010UF K	
C551			C92-0619-05	CHIP TAN 47UF 4WV	
C552			CK73HB1C103K	CHIP C 0.010UF K	
C553			CK73HB1H471K	CHIP C 470PF K	
C554			CK73GB1C104K	CHIP C 0.10UF K	
C555			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C556,557			CK73HB1H471K	CHIP C 470PF K	
C558			CK73GB1C104K	CHIP C 0.10UF K	
C559			CK73GB1E123K	CHIP C 0.012UF K	
C560			CK73HB1H471K	CHIP C 470PF K	
C561			CK73HB1C103K	CHIP C 0.010UF K	
C562			CK73HB1H102K	CHIP C 1000PF K	
C563			CK73HB1H471K	CHIP C 470PF K	
C564			CK73HB1H102K	CHIP C 1000PF K	
C565			CC73HCH1H560JY	CHIP C 56PF J	
C566			CK73HB1H222K	CHIP C 2200PF K	
C567			CK73HB1H471K	CHIP C 470PF K	
C568			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C569-571			CK73HB1H471K	CHIP C 470PF K	
C572			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C573		*	CK73HB1A473K	CHIP C 0.047UF K	
C574		*	CK73HB1A104K	CHIP C 0.10UF K	
C575,576		*	CK73HB1A104K	CHIP C 0.10UF K	K
C575,576			CK73HB1C223K	CHIP C 0.022UF K	E
C577-579			CK73FB1A105K	CHIP C 1.0UF K	
C580			CK73HB1H222K	CHIP C 2200PF K	
C581			CK73FB1A105K	CHIP C 1.0UF K	
C582,583			CK73GB1C104K	CHIP C 0.10UF K	
C584,585			CK73HB1H471K	CHIP C 470PF K	
C586			CK73FB1A105K	CHIP C 1.0UF K	
C587,588			CK73HB1C103K	CHIP C 0.010UF K	
C589			CK73GB1C104K	CHIP C 0.10UF K	
C590			CK73HB1C223K	CHIP C 0.022UF K	
C591			CK73HB1C103K	CHIP C 0.010UF K	
C592,593			CK73HB1H471K	CHIP C 470PF K	
C594			CK73HB1C223K	CHIP C 0.022UF K	
C595			CK73HB1C682K	CHIP C 6800PF K	
C596			CK73HB1C103K	CHIP C 0.010UF K	
C597			CK73FB1A105K	CHIP C 1.0UF K	
C598			CK73HB1E472K	CHIP C 4700PF K	
C599			CK73HB1C223K	CHIP C 0.022UF K	
C600			CK73HB1C682K	CHIP C 6800PF K	
C601		*	CK73HB1A473K	CHIP C 0.047UF K	
C602			CK73HB1C682K	CHIP C 6800PF K	
C603			CK73HB1H222K	CHIP C 2200PF K	
C604			CK73HB1H391K	CHIP C 390PF K	
C605			CC73HCH1E221J	CHIP C 220PF J	
C606			CK73HB1C103K	CHIP C 0.010UF K	
C607			CK73FB1A105K	CHIP C 1.0UF K	
C608			CK73HB1C103K	CHIP C 0.010UF K	
C609			CK73HB1H102K	CHIP C 1000PF K	
C610			CK73HB1H471K	CHIP C 470PF K	
C611			CC73HCH1H101J	CHIP C 100PF J	
C612,613			CK73GB1C104K	CHIP C 0.10UF K	

Ref. No.	Adress	New parts	Parts No.	Description	Destination
C614-616			CK73HB1H471K	CHIP C 470PF K	
C617,618			CK73GB1C104K	CHIP C 0.10UF K	
C619			CK73FB1A105K	CHIP C 1.0UF K	
C620,621			CK73GB1C104K	CHIP C 0.10UF K	
C622-625			CK73FB1A105K	CHIP C 1.0UF K	
C626,627			CK73HB1C103K	CHIP C 0.010UF K	
C628-630			CK73HB1H471K	CHIP C 470PF K	
C631			CK73GB1C104K	CHIP C 0.10UF K	
C632			CK73HB1C223K	CHIP C 0.022UF K	
C640-644			CK73GB1C104K	CHIP C 0.10UF K	
C647,648		*	CK73HB1A104K	CHIP C 0.10UF K	
C651,652		*	CK73HB1A104K	CHIP C 0.10UF K	
C659			CK73EF1A106Z	CHIP C 10UF Z	
C660		*	CK73HB1A104K	CHIP C 0.10UF K	
C661			CC73HCH1H030C	CHIP C 3.0PF C	
C662		*	CC73HCH1H160J	CHIP C 16PF J	
C663,664		*	CK73HB1A104K	CHIP C 0.10UF K	
C665			C92-0619-05	CHIP TAN 47UF 4WV	
C666		*	CK73HB1A104K	CHIP C 0.10UF K	
C667			CK73FB1E224K	CHIP C 0.22UF K	
C668			CK73HB1H102K	CHIP C 1000PF K	
C669		*	CK73HB1A473K	CHIP C 0.047UF K	
C670			CK73HB1C103K	CHIP C 0.010UF K	
C671			CC73HCH1H020C	CHIP C 2.0PF C	
C672			C92-0619-05	CHIP TAN 47UF 4WV	
C673			CK73EF1A106Z	CHIP C 10UF Z	
C674			CK73FB1A105K	CHIP C 1.0UF K	
C675			CC73HCH1H470J	CHIP C 47PF J	
TC1			C05-0384-05	CERAMIC TRIMMER CAP(10PF)	
CN1			E40-5902-05	FLAT CABLE CONNECTOR(36P)	
CN500			E40-5630-05	PIN ASSY SOCKET (6P:PTT)	
CN501			E40-5629-05	PIN ASSY (6P:PTT)	
CN502			E40-5409-05	PIN ASSY (5P:VOL)	
CN504			E40-5902-05	FLAT CABLE CONNECTOR(36P)	
CN505		*	E40-5972-05	FLAT CABLE CONNECTOR(30P)	
CN506			E40-5392-05	PIN ASSY (VOL)	
J1			E03-0170-05	DC JACK	
J500			E11-0457-05	PHONE JACK (2.5/3.5)	
J501,502			E11-0439-05	2.5D PHONE JACK(5P)	
W500			E37-0697-05	PROCESSED LEAD WIRE	
706		*	F10-2275-04	SHIELDING CASE (VHF VCO)	
F1			F53-0128-05	FUSE (0.5A)	
CD1			L79-1072-05	TUNING COIL	
CD2			L79-1474-05	TUNING COIL (450KHZ)	
CF1			L72-0916-05	CERAMIC FILTER(455KHZ)	
CF2			L72-0945-05	CERAMIC FILTER(450KHZ)	
L1			L92-0137-05	FERRITE CHIP	
L2			L92-0140-05	FERRITE CHIP	
L3 ,4			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
L5			L92-0140-05	FERRITE CHIP	
L6			L40-1875-77	SMALL FIXED INDUCTOR(18NH)	
L7			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
L9		*	L40-3381-86	SMALL FIXED INDUCTOR(0.33UH)	
L10 ,11			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L12		*	L40-3381-86	SMALL FIXED INDUCTOR(0.33UH)	
L13			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
L15			L92-0140-05	FERRITE CHIP	
L16			L40-2275-77	SMALL FIXED INDUCTOR(22N)	
L17			L40-1095-68	SMALL FIXED INDUCTOR(1UH)	
L18			L34-4513-05	AIR-CORE COIL(2.5T)	

PARTS LIST

TX-RX UNIT (X57-570X-X)

Ref. No.	Adress	New parts	Parts No.	Description	Destination
L19			L34-4515-05	AIR-CORE COIL(3.5T)	
L20			L40-1275-54	SMALL FIXED INDUCTOR(12NH)	
L23			L40-2775-54	SMALL FIXED INDUCTOR(27NH)	
L24			L34-4513-05	AIR-CORE COIL(2.5T)	
L25			L40-1092-81	SMALL FIXED INDUCTOR	
L26			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
L27			L40-5675-77	SMALL FIXED INDUCTOR(56NH)	
L28			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
L29			L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L30			L79-1492-05	FILTER MODULE(435MHZ)	E
L30			L79-1493-05	FILTER MODULE(445MHZ)	K
L30		*	L79-1574-05	FILTER MODULE(435MHZ)	E
L30		*	L79-1575-05	FILTER MODULE(444MHZ)	K
L31			L40-1575-77	SMALL FIXED INDUCTOR(15NH)	
L32			L40-6875-54	SMALL FIXED INDUCTOR(68NH)	
L33			L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
L34			L40-2775-77	SMALL FIXED INDUCTOR(27NH)	
L35 ,36			L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L37			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
L39			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
L51			L40-1875-77	SMALL FIXED INDUCTOR(18NH)	
L53			L40-6875-77	SMALL FIXED INDUCTOR(68NH)	
L54			L40-1095-68	SMALL FIXED INDUCTOR(1UH)	
L55			L34-1374-05	AIR-CORE COIL(6.5T)	
L56			L34-1333-05	AIR-CORE COIL(8.5T)	
L58		*	L40-1281-86	SMALL FIXED INDUCTOR(0.12UH)	
L59			L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
L62			L40-8285-34	SMALL FIXED INDUCTOR(820NH)	
L63			L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
L65 ,66			L40-1585-54	SMALL FIXED INDUCTOR(150NH)	
L68		*	L40-1281-86	SMALL FIXED INDUCTOR(0.12UH)	
L69			L34-4506-05	COIL	
L70			L40-1095-68	SMALL FIXED INDUCTOR(1UH)	
L71			L34-4506-05	COIL	
L72			L34-4507-05	COIL	
L73			L40-3375-54	SMALL FIXED INDUCTOR(33NH)	
L74			L40-3975-54	SMALL FIXED INDUCTOR(39NH)	
L75			L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
L78			L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
L79 ,80			L92-0149-05	FERRITE CHIP	
L83		*	L34-4580-05	AIR-CORE COIL(4.5T)	
L84			L34-1331-05	AIR-CORE COIL(5.5T)	
L85		*	L34-4579-05	AIR-CORE COIL(8.5T)	
L86			L34-4515-05	AIR-CORE COIL(3.5T)	
L87 ,88		*	L34-4389-05	AIR-CORE COIL(9.5T)	
L89			L40-1085-77	SMALL FIXED INDUCTOR(100NH)	
L90 ,91			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
L92			L40-2275-54	SMALL FIXED INDUCTOR(22NH)	
L93			L40-3375-54	SMALL FIXED INDUCTOR(33NH)	
L94			L92-0140-05	FERRITE CHIP	
L500,501			L92-0140-05	FERRITE CHIP	
L502,503		*	L33-1358-05	SMALL FIXED INDUCTOR(330UH)	
L504-511			L92-0140-05	FERRITE CHIP	
X1		*	L77-1783-05	CRYSTAL RESONATOR(12.8MHZ)	
X2		*	L77-1789-05	CRYSTAL RESONATOR(45.505MHZ)	
X500		*	L78-0459-05	RESONATOR (4.19MHZ/12)	
X501		*	L77-1780-05	CRYSTAL RESONATOR(7.9872MHZ)	
XF1			L71-0482-05	MCF (45SC15BB)	
XF2		*	L71-0535-05	MCF (38.85MHZ)	
CP1		*	RK75HA1J332J	MULTIPLE R (3.3K X2)	

Ref. No.	Adress	New parts	Parts No.	Description	Destination
CP2			R90-0741-05	MULTIPLE R (1K X2)	
CP3		*	RK75HA1J332J	MULTIPLE R (3.3K X2)	
CP4			R90-0741-05	MULTIPLE R (1K X2)	
CP5		*	RK75HA1J332J	MULTIPLE R (3.3K X2)	
CP501,502			R90-0741-05	MULTIPLE R (1K X2)	
CP504-508			R90-0741-05	MULTIPLE R (1K X2)	
CP509			R90-0740-05	MULTIPLE R (100K X2)	
CP510-513			R90-0741-05	MULTIPLE R (1K X2)	
CP514-521			R90-0749-05	MULTIPLE R (330 X2)	
CP522			R90-0741-05	MULTIPLE R (1K X2)	
CP528			R90-0740-05	MULTIPLE R (100K X2)	
CP529			R90-0741-05	MULTIPLE R (1K X2)	
R1			RK73HB1J101J	CHIP R 100 J 1/16W	
R2			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R3			RK73HB1J474J	CHIP R 470K J 1/16W	
R4			RK73HB1J273J	CHIP R 27K J 1/16W	
R5			R92-1368-05	CHIP R 0 OHM	
R6			RK73HB1J224J	CHIP R 220K J 1/16W	
R7			RK73HB1J471J	CHIP R 470 J 1/16W	
R8 ,9			RK73HB1J103J	CHIP R 10K J 1/16W	
R10 ,11			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R12			RK73GB1J120J	CHIP R 12 J 1/16W	
R13			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R14			RK73GB1J103J	CHIP R 10K J 1/16W	
R15			RK73HB1J101J	CHIP R 100 J 1/16W	
R16 ,17			RK73HB1J103J	CHIP R 10K J 1/16W	
R18			R92-1368-05	CHIP R 0 OHM	
R19			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R20			RK73HB1J103J	CHIP R 10K J 1/16W	
R21			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R22			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R23			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R24 ,25			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R26			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R27			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R28			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R29			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R30			RK73HB1J103J	CHIP R 10K J 1/16W	
R31			RK73HB1J101J	CHIP R 100 J 1/16W	
R32			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R33			RK73HB1J474J	CHIP R 470K J 1/16W	
R34			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R35 ,36			RK73HB1J331J	CHIP R 330 J 1/16W	
R37			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R38			R92-1252-05	CHIP R 0 OHM	
R39			RK73HB1J123J	CHIP R 12K J 1/16W	
R40			RK73HB1J223J	CHIP R 22K J 1/16W	
R41			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R42			RK73HB1J103J	CHIP R 10K J 1/16W	
R43			RK73HB1J474J	CHIP R 470K J 1/16W	
R44			RK73HB1J471J	CHIP R 470 J 1/16W	
R45 ,46			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R47			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R48			RK73HB1J821J	CHIP R 820 J 1/16W	
R49			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R51			R92-1252-05	CHIP R 0 OHM	
R52			RK73HB1J104J	CHIP R 100K J 1/16W	
R53			RK73HB1J470J	CHIP R 47 J 1/16W	
R54			R92-1368-05	CHIP R 0 OHM	
R55			RK73HB1J154J	CHIP R 150K J 1/16W	

PARTS LIST

X-RX UNIT (X57-570X-XX)

Ref. No.	Adress	New parts	Parts No.	Description	Destination
R56			RK73HB1J470J	CHIP R 47 J 1/16W	
R58			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R59			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R60			R92-1252-05	CHIP R 0 OHM	
R61			RK73HB1J393J	CHIP R 39K J 1/16W	
R62			RK73HB1J273J	CHIP R 27K J 1/16W	
R63,64			RK73HB1J103J	CHIP R 10K J 1/16W	
R65			RK73HB1J474J	CHIP R 470K J 1/16W	
R66			RK73HB1J471J	CHIP R 470 J 1/16W	
R67,68			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R69			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R70			RK73HB1J821J	CHIP R 820 J 1/16W	
R71			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R72,73			R92-1252-05	CHIP R 0 OHM	
R74			RK73HB1J154J	CHIP R 150K J 1/16W	
R75			R92-1252-05	CHIP R 0 OHM	
R76			RK73HB1J470J	CHIP R 47 J 1/16W	
R77			RK73HB1J154J	CHIP R 150K J 1/16W	
R78			RK73HB1J470J	CHIP R 47 J 1/16W	
R80			RK73HB1J103J	CHIP R 10K J 1/16W	
R81			RK73HB1J100J	CHIP R 10 J 1/16W	
R82			RK73HB1J103J	CHIP R 10K J 1/16W	
R83			R92-1368-05	CHIP R 0 OHM	
R84			RK73HB1J154J	CHIP R 150K J 1/16W	
R85			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R86			RK73HB1J474J	CHIP R 470K J 1/16W	
R87			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R88			RK73HB1J224J	CHIP R 220K J 1/16W	
R89			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R90			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R91			RK73HB1J104J	CHIP R 100K J 1/16W	
R92			RK73HB1J561J	CHIP R 560 J 1/16W	
R93			RK73HB1J470J	CHIP R 47 J 1/16W	
R94			R92-1252-05	CHIP R 0 OHM	
R95			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R96			RK73HB1J474J	CHIP R 470K J 1/16W	
R97			RK73HB1J100J	CHIP R 10 J 1/16W	
R98			RK73HB1J101J	CHIP R 100 J 1/16W	
R99			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R100			RK73HB1J154J	CHIP R 150K J 1/16W	
R101			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R102			RK73HB1J474J	CHIP R 470K J 1/16W	
R103			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R104			RK73HB1J224J	CHIP R 220K J 1/16W	
R105			RK73HB1J272J	CHIP R 2.7K J 1/16W	
R106			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R107			RK73HB1J333J	CHIP R 33K J 1/16W	
R108			RK73HB1J821J	CHIP R 820 J 1/16W	
R109			RK73HB1J470J	CHIP R 47 J 1/16W	
R110			R92-1252-05	CHIP R 0 OHM	
R111			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R112			RK73HB1J153J	CHIP R 15K J 1/16W	
R113			RK73HB1J474J	CHIP R 470K J 1/16W	
R114			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R115			RK73HB1J474J	CHIP R 470K J 1/16W	
R116			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R117			RK73HB1J564J	CHIP R 560K J 1/16W	
R118			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R119			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R120			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R121			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R122			RK73HB1J473J	CHIP R 47K J 1/16W	
R123			RK73HB1J103J	CHIP R 10K J 1/16W	
R124			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R125,126			RK73HB1J104J	CHIP R 100K J 1/16W	
R127			RK73HB1J333J	CHIP R 33K J 1/16W	
R128			RK73HB1J561J	CHIP R 560 J 1/16W	
R129			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R130			RK73HB1J563J	CHIP R 56K J 1/16W	
R131			RK73HB1J220J	CHIP R 22 J 1/16W	
R132			RK73HB1J470J	CHIP R 47 J 1/16W	
R133			RK73HB1J151J	CHIP R 150 J 1/16W	
R134			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R135			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R136			RK73HB1J220J	CHIP R 22 J 1/16W	
R137			RK73HB1J561J	CHIP R 560 J 1/16W	
R138			RK73HB1J180J	CHIP R 18 J 1/16W	
R140			R92-1368-05	CHIP R 0 OHM	
R142			RK73HB1J680J	CHIP R 68 J 1/16W	
R143			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R144			RK73HB1J271J	CHIP R 270 J 1/16W	
R145			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R146			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R147			R92-1368-05	CHIP R 0 OHM	
R148,149			RK73HB1J104J	CHIP R 100K J 1/16W	
R150			RK73HB1J561J	CHIP R 560 J 1/16W	
R151			RK73HB1J224J	CHIP R 220K J 1/16W	
R152			RK73HB1J104J	CHIP R 100K J 1/16W	
R153			RK73HB1J470J	CHIP R 47 J 1/16W	
R154			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R155			RK73HB1J101J	CHIP R 100 J 1/16W	
R156			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R158			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R159			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R160,161			RK73HB1J104J	CHIP R 100K J 1/16W	
R162			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R163			R92-1252-05	CHIP R 0 OHM	
R164			RK73GB1J221J	CHIP R 220 J 1/16W	
R165			RK73HB1J104J	CHIP R 100K J 1/16W	
R167			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R168			R92-1252-05	CHIP R 0 OHM	
R174			R92-1252-05	CHIP R 0 OHM	
R175			RK73HB1J474J	CHIP R 470K J 1/16W	
R176			RK73HB1J333J	CHIP R 33K J 1/16W	
R177			R92-1368-05	CHIP R 0 OHM	
R178			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R179			RK73HB1J224J	CHIP R 220K J 1/16W	
R181			RK73HB1J103J	CHIP R 10K J 1/16W	
R182			RK73HB1J151J	CHIP R 150 J 1/16W	
R183			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R184			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R185			RK73HB1J270J	CHIP R 27 J 1/16W	
R186			RK73HB1J561J	CHIP R 560 J 1/16W	
R187			RK73HB1J180J	CHIP R 18 J 1/16W	
R189			R92-1368-05	CHIP R 0 OHM	
R191			RK73HB1J680J	CHIP R 68 J 1/16W	
R192			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R195			RK73HB1J271J	CHIP R 270 J 1/16W	
R196			RK73HB1J101J	CHIP R 100 J 1/16W	
R197			RK73HB1J222J	CHIP R 2.2K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-570X-XX

Ref. No.	Adress	New parts	Parts No.	Description	Destination
R198			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R199			RK73HB1J103J	CHIP R 10K J 1/16W	
R200			RK73HB1J271J	CHIP R 270 J 1/16W	
R201			R92-1252-05	CHIP R 0 OHM	
R202			RK73HB1J104J	CHIP R 100K J 1/16W	
R203			RK73HB1J220J	CHIP R 22 J 1/16W	
R204			RK73HB1J223J	CHIP R 22K J 1/16W	
R205			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R206			RK73HB1J104J	CHIP R 100K J 1/16W	
R207			RK73HB1J122J	CHIP R 1.2K J 1/16W	
R208			R92-1252-05	CHIP R 0 OHM	
R209			RK73HB1J224J	CHIP R 220K J 1/16W	
R210			RK73HB1J104J	CHIP R 100K J 1/16W	
R211			R92-1368-05	CHIP R 0 OHM	
R212			RK73HB1J470J	CHIP R 47 J 1/16W	
R213			R92-1368-05	CHIP R 0 OHM	
R214			RK73HB1J823J	CHIP R 82K J 1/16W	
R215			RK73HB1J104J	CHIP R 100K J 1/16W	
R216			RK73HB1J103J	CHIP R 10K J 1/16W	
R217			RK73HB1J104J	CHIP R 100K J 1/16W	
R218,219			RK73HB1J103J	CHIP R 10K J 1/16W	
R220			RK73HB1J823J	CHIP R 82K J 1/16W	
R221			RK73HB1J103J	CHIP R 10K J 1/16W	
R222			RK73HB1J104J	CHIP R 100K J 1/16W	
R223			RK73HB1J473J	CHIP R 47K J 1/16W	
R224,225			RK73HB1J104J	CHIP R 100K J 1/16W	
R226			R92-1368-05	CHIP R 0 OHM	
R227			R92-1252-05	CHIP R 0 OHM	
R228,229			RK73HB1J104J	CHIP R 100K J 1/16W	
R231			R92-1252-05	CHIP R 0 OHM	
R232-234			RK73HB1J104J	CHIP R 100K J 1/16W	
R235			RK73HB1J470J	CHIP R 47 J 1/16W	
R236			RK73HB1J221J	CHIP R 220 J 1/16W	
R237			RK73HB1J220J	CHIP R 22 J 1/16W	
R238			RK73HB1J223J	CHIP R 22K J 1/16W	
R239			RK73HB1J473J	CHIP R 47K J 1/16W	
R240			RK73HB1J821J	CHIP R 820 J 1/16W	
R241,242			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R243			RK73HB1J103J	CHIP R 10K J 1/16W	
R244			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R245			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R247,248			RK73HB1J104J	CHIP R 100K J 1/16W	
R249			RK73HB1J224J	CHIP R 220K J 1/16W	
R501-505			RK73HB1J221J	CHIP R 220 J 1/16W	
R506			RK73HB1J683J	CHIP R 68K J 1/16W	
R509			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R512			RK73HB1J101J	CHIP R 100 J 1/16W	
R514			RK73HB1J103J	CHIP R 10K J 1/16W	
R522			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R523			RK73HB1J103J	CHIP R 10K J 1/16W	
R525			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R526			RK73HB1J473J	CHIP R 47K J 1/16W	
R530			RK73HB1J184J	CHIP R 180K J 1/16W	
R531			RK73HB1J474J	CHIP R 470K J 1/16W	
R533			RK73HB1J101J	CHIP R 100 J 1/16W	
R534			RK73HB1J470J	CHIP R 47 J 1/16W	
R535			RK73HB1J474J	CHIP R 470K J 1/16W	
R536			RK73HB1J103J	CHIP R 10K J 1/16W	
R537,538			RK73HB1J104J	CHIP R 100K J 1/16W	
R540			RK73HB1J104J	CHIP R 100K J 1/16W	
R541			RK73HB1J223J	CHIP R 22K J 1/16W	
R542			RK73HB1J100J	CHIP R 10 J 1/16W	
R543			RK73HB1J471J	CHIP R 470 J 1/16W	
R544			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R545-548			RK73HB1J473J	CHIP R 47K J 1/16W	
R550			RK73HB1J103J	CHIP R 10K J 1/16W	
R551			RK73HB1J393J	CHIP R 39K J 1/16W	
R552			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R553			RK73HB1J564J	CHIP R 560K J 1/16W	
R554			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R555			RK73HB1J103J	CHIP R 10K J 1/16W	
R557			RK73HB1J334J	CHIP R 330K J 1/16W	
R559			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R560			RK73HB1J331J	CHIP R 330 J 1/16W	
R561			RK73HB1J474J	CHIP R 470K J 1/16W	
R562-564			R92-1368-05	CHIP R 0 OHM	
R566			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R567			RK73HB1J124J	CHIP R 120K J 1/16W	
R568			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R569,570			RK73HB1J153J	CHIP R 15K J 1/16W	
R571			RK73HB1J104J	CHIP R 100K J 1/16W	
R572			RK73HB1J563J	CHIP R 56K J 1/16W	
R573			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R574			RK73HB1J473J	CHIP R 47K J 1/16W	
R575			RK73HB1J471J	CHIP R 470 J 1/16W	
R576			RK73HB1J182J	CHIP R 1.8K J 1/16W	
R577			RK73HB1J153J	CHIP R 15K J 1/16W	
R578			R92-1368-05	CHIP R 0 OHM	
R579			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R580			RK73HB1J223J	CHIP R 22K J 1/16W	
R581			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R582			RK73HB1J153J	CHIP R 15K J 1/16W	
R583,584			RK73HB1J104J	CHIP R 100K J 1/16W	
R585			RK73HB1J474J	CHIP R 470K J 1/16W	
R586			RK73HB1J471J	CHIP R 470 J 1/16W	
R587			RK73HB1J474J	CHIP R 470K J 1/16W	
R588			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R589			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R590			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R591			RK73HB1J104J	CHIP R 100K J 1/16W	
R592			RK73HB1J154J	CHIP R 150K J 1/16W	
R593			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R594			RK73HB1J104J	CHIP R 100K J 1/16W	
R595			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R596			RK73HB1J104J	CHIP R 100K J 1/16W	
R597			RK73HB1J473J	CHIP R 47K J 1/16W	
R598			RK73HB1J563J	CHIP R 56K J 1/16W	
R599,600			RK73HB1J224J	CHIP R 220K J 1/16W	
R601			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R602			RK73HB1J123J	CHIP R 12K J 1/16W	
R603			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R604			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R606			RK73HB1J223J	CHIP R 22K J 1/16W	
R607			RK73HB1J393J	CHIP R 39K J 1/16W	
R608			RK73HB1J104J	CHIP R 100K J 1/16W	
R609			RK73HB1J154J	CHIP R 150K J 1/16W	
R610			RK73HB1J563J	CHIP R 56K J 1/16W	
R611			RK73HB1J331J	CHIP R 330 J 1/16W	
R612			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R613			RK73HB1J563J	CHIP R 56K J 1/16W	

PARTS LIST

X-RX UNIT (X57-570X-XX)

Ref. No.	Adress	New parts	Parts No.	Description	Destination
R614			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R616-619			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R620			RK73HB1J103J	CHIP R 10K J 1/16W	
R621			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R622,623			R92-1368-05	CHIP R 0 OHM	
R624			RK73HB1J123J	CHIP R 12K J 1/16W	
R625,626			RK73HB1J104J	CHIP R 100K J 1/16W	
R627			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R628			RK73HB1J123J	CHIP R 12K J 1/16W	
R629,630			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R631			RK73HB1J103J	CHIP R 10K J 1/16W	
R632			RK73HB1J123J	CHIP R 12K J 1/16W	
R633			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R634			RK73HB1J103J	CHIP R 10K J 1/16W	
R635-637			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R638			RK73HB1J103J	CHIP R 10K J 1/16W	
R641			RK73HB1J103J	CHIP R 10K J 1/16W	K
R641			RK73HB1J822J	CHIP R 8.2K J 1/16W	E
R642			RK73HB1J103J	CHIP R 10K J 1/16W	
R643			RK73HB1J123J	CHIP R 12K J 1/16W	
R644			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R645			RK73HB1J104J	CHIP R 100K J 1/16W	
R646			RK73HB1J103J	CHIP R 10K J 1/16W	
R647-649			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R650			RK73HB1J123J	CHIP R 12K J 1/16W	
R651			RK73HB1J103J	CHIP R 10K J 1/16W	
R652-654			RK73HB1J332J	CHIP R 3.3K J 1/16W	
R655			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R656			RK73HB1J473J	CHIP R 47K J 1/16W	
R657,658			RK73HB1J223J	CHIP R 22K J 1/16W	
R659			RK73HB1J103J	CHIP R 10K J 1/16W	
R660			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R661			RK73HB1J563J	CHIP R 56K J 1/16W	
R662			RK73HB1J103J	CHIP R 10K J 1/16W	
R663			RK73HB1J393J	CHIP R 39K J 1/16W	
R664			RK73HB1J103J	CHIP R 10K J 1/16W	
R665			RK73HB1J823J	CHIP R 82K J 1/16W	
R666			RK73HB1J154J	CHIP R 150K J 1/16W	
R667			RK73HB1J473J	CHIP R 47K J 1/16W	
R668,669			RK73HB1J331J	CHIP R 330 J 1/16W	
R670			R92-1368-05	CHIP R 0 OHM	
R671			RK73HB1J331J	CHIP R 330 J 1/16W	
R673			RK73HB1J224J	CHIP R 220K J 1/16W	
R674			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R675,676			RK73HB1J473J	CHIP R 47K J 1/16W	
R677			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R678			RK73HB1J221J	CHIP R 220 J 1/16W	
R679,680			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R682			RK73HB1J104J	CHIP R 100K J 1/16W	
R684			RK73HB1J224J	CHIP R 220K J 1/16W	
R685			RK73HB1J473J	CHIP R 47K J 1/16W	
R686			R92-1368-05	CHIP R 0 OHM	
R688			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R689,690			RK73HB1J104J	CHIP R 100K J 1/16W	
R692			RK73HB1J104J	CHIP R 100K J 1/16W	
R693			RK73HB1J563J	CHIP R 56K J 1/16W	
R694			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R695			RK73HB1J223J	CHIP R 22K J 1/16W	
R696			R92-1368-05	CHIP R 0 OHM	
R697			RK73HB1J473J	CHIP R 47K J 1/16W	
R698			RK73HB1J221J	CHIP R 220 J 1/16W	
R699			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R706			RK73HB1J221J	CHIP R 220 J 1/16W	
R707,708			R92-1252-05	CHIP R 0 OHM	
R714			R92-1368-05	CHIP R 0 OHM	
R715			RK73HB1J474J	CHIP R 470K J 1/16W	
R716			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R718			RK73HB1J473J	CHIP R 47K J 1/16W	
R719			RK73HB1J474J	CHIP R 470K J 1/16W	
R720,721			R92-1252-05	CHIP R 0 OHM	
R722,723			RK73HB1J221J	CHIP R 220 J 1/16W	
R725			R92-1252-05	CHIP R 0 OHM	
R726			R92-1368-05	CHIP R 0 OHM	
R727			RK73HB1J222J	CHIP R 2.2K J 1/16W	
R728			RK73HB1J104J	CHIP R 100K J 1/16W	
VR1 ,2			R12-7490-05	TRIMMING POT.(47K/B)	
VR3			R12-7490-05	TRIMMING POT.(47K/B)	E
VR500		*	R12-7494-05	TRIMMING POT.(220K/B)	
VR501			R39-0602-05	VARIABLE RESISTOR(10K A)	
S500			S70-0424-05	TACT SWITCH	
MIC500	2B		T91-0580-05	MIC ELEMENT	
D1			RB751V-40	DIODE	
D2			DTZ3.9(B)	ZENER DIODE	
D3			SFPB-72VL	DIODE	
D4			1SS357	DIODE	
D5			DA221	DIODE	
D6			RB751V-40	DIODE	
D8			DA221	DIODE	
D9			MA2S111	DIODE	
D10 -12			HSC277	DIODE	
D13			DA221	DIODE	
D14			MA2S111	DIODE	
D15			HSC277	DIODE	
D17			HSC277	DIODE	
D18			RB706F-40	DIODE	
D19			DA221	DIODE	
D20			HVU131	DIODE	
D21 ,22			HSC277	DIODE	
D23			DAN222	DIODE	
D24			DAN235	DIODE	
D25			HSC277	DIODE	
D26			DAN235E	DIODE	
D27 ,28			HVC350B	VARIABLE CAPACITANCE DIODE	
D29			DA221	DIODE	
D30			HVU131	DIODE	
D31			HSC277	DIODE	
D32 -34			HVC350B	VARIABLE CAPACITANCE DIODE	
D36			HVC350B	VARIABLE CAPACITANCE DIODE	
D37 ,38		*	MA2S304	VARIABLE CAPACITANCE DIODE	
D40			DAN222	DIODE	
D42 -44			HSC277	DIODE	
D500			MA2S111	DIODE	
D501			DA227	DIODE	
D502,503			MA2S111	DIODE	
D506			DA227	DIODE	
D507			MA2S111	DIODE	
D508			MA2S111	DIODE	X
D509,510			B30-2157-05	LED(YELLOW/8)	
D511			B30-2143-05	LED(YG/8)	
D512,513			B30-2131-05	LED	

PARTS LIST

TX-RX UNIT (X57-570X-XX

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
D516,517			MA2S111	DIODE	
D518			B30-2143-05	LED(YG/8)	
D526			MA2S111	DIODE	
D527			DTZ3.9(B)	ZENER DIODE	
D528		*	DTZ4.3(A)	ZENER DIODE	
D529			1SS388	DIODE	
D530		*	DTZ4.3(A)	ZENER DIODE	
D531			MA2S111	DIODE	
D532			B30-2143-05	LED(YG/8)	
D533,534			MA2S111	DIODE	
D535			B30-2143-05	LED(YG/8)	
D536-539			B30-2157-05	LED(YELLOW/8)	
IC1 ,2			LMC7101BIM5	IC(OP AMP)	
IC3			TC7660SEOA	IC	
IC4			BU2090FS	IC(SHIFT/STORE REGISTER)	
IC6		*	MB15E03L	IC(PLL SYNTHESIZER)	
IC7			TC7S66FU	IC(ANALOG SWITCH)	
IC9		*	MB15E03L	IC(PLL SYNTHESIZER)	
IC10			TC7S66FU	IC(ANALOG SWITCH)	
IC12,13			TA31136FN	IC(FM IF DETECTOR)	
IC14			TC4W53FU	IC(2 INPUT NAND GATE)	
IC15	3A		M67799MA	IC(POWER MODULE:UHF)	
IC16	3A		M67798LRA	IC(POWER MODULE:VHF)	
IC17		*	UPB1509GV	IC	
IC18			TA75W01FU	IC(OP AMP X2)	
IC500			KIA6278F	IC	
IC501			X25650S8I-2.5	IC(EEPROM)	
IC503		*	RN5VT32C	IC(CONVERTER)	
IC504		*	RN5VT25A	IC(REGULATOR)	
IC505		*	78F4216GCJUKB	IC(CPU)	
IC506			TA75W01FU	IC(OP AMP X2)	
IC507,508			S-81335HG-KI	IC	
IC509			AK2343	IC(CTCSS ENCODER/DECODER)	
IC510		*	TGT0120Q	IC	
IC511		*	TMT0110Q	IC	
IC512		*	TA75W393FU	IC	
IC513		*	BU4053BCFV	IC	
IC514			TA75W01FU	IC(OP AMP X2)	
IC515			TA75S393F	IC	
IC516		*	X25097VI-1.8	IC(EEPROM)	
IC517			TA75W01FU	IC(OP AMP X2)	
IC518		*	ADM3202ARU	IC	
Q1			2SC4617(R)	TRANSISTOR	
Q2			2SK1824	FET	
Q3			UMG1	TRANSISTOR	
Q4			UMA11N	TRANSISTOR	
Q5			UPA672T	FET	
Q6			2SD1483	TRANSISTOR	
Q7			2SB1188(Q)	TRANSISTOR	
Q8 ,9			UMW1	TRANSISTOR	
Q10			*2SB1184(Q,R)	TRANSISTOR	
Q11 ,12			IMD16A	TRANSISTOR	
Q13 -15			UMA11N	TRANSISTOR	
Q16 ,17			UMA10N	TRANSISTOR	
Q18			2SC4617(R)	TRANSISTOR	
Q19		*	2SA1774(R)	TRANSISTOR	
Q20			2SC4617(R)	TRANSISTOR	
Q21			2SC4617(S)	TRANSISTOR	
Q22 ,23			2SC5108(Y)	TRANSISTOR	
Q24		*	2SA1774(R)	TRANSISTOR	

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
Q25			2SC4617(R)	TRANSISTOR	
Q26			2SC4617(S)	TRANSISTOR	
Q27 ,28			2SC5108(Y)	TRANSISTOR	
Q29 -31			*2SC4649(N,P)	TRANSISTOR	
Q32 -35			2SC4617(R)	TRANSISTOR	
Q36			2SC5108(Y)	TRANSISTOR	
Q37			2SC3356	TRANSISTOR	
Q38			2SK1824	FET	
Q39 ,40			3SK309	FET	
Q45			2SK1824	FET	
Q46			2SC3356	TRANSISTOR	
Q47			DTC144EE	DIGITAL TRANSISTOR	
Q48			3SK309	FET	
Q49			3SK239A	FET	
Q50			3SK309	FET	
Q51			DTC144EE	DIGITAL TRANSISTOR	
Q52			2SC4617(R)	TRANSISTOR	
Q53			3SK239A	FET	
Q54			2SC5108(Y)	TRANSISTOR	
Q55			2SK1875(V)	FET	
Q56			DTC114YE	DIGITAL TRANSISTOR	
Q57			UPA672T	FET	
Q58 ,59			2SJ243	FET	
Q60			2SC4617(R)	TRANSISTOR	
Q61			2SK1824	FET	E
Q62 ,63			2SK1824	FET	
Q504			2SK1588	FET	
Q510,511			2SC4617(R)	TRANSISTOR	
Q512,513			2SB1188(Q)	TRANSISTOR	
Q514			UPA672T	FET	
Q515,516			2SJ243	FET	
Q517			2SK1824	FET	
Q518			2SJ243	FET	
Q519			2SK1824	FET	
Q520			2SC4617(R)	TRANSISTOR	
Q521			IMD16A	TRANSISTOR	
Q522,523			2SK1824	FET	
Q524		*	2SA1774(R)	TRANSISTOR	
Q525,526			2SK1824	FET	
Q527-529			2SC4617(R)	TRANSISTOR	
Q530			UPA672T	FET	
Q531-533			2SK1824	FET	
Q534,535			2SJ243	FET	
Q536			2SC4997	TRANSISTOR	
Q537			2SJ243	FET	
Q538			DTC144EE	DIGITAL TRANSISTOR	
Q539			2SK1824	FET	
TH1			157-104-65001	THERMISTOR(100K)	
TH501			157-153-65001	THERMISTOR(15K)	
A1		*	X58-4600-11	SUB UNIT (UHF VCO)	K
A1		*	X58-4602-71	SUB UNIT (UHF VCO)	E

SUB UNIT (UHF VCO) (X58-460X-XX) 0-11:K, 2-71:E

Ref. No.	Adrress	New parts	Parts No.	Description	Destination
C1			CK73HB1H471K	CHIP C 470PF K	
C3			CK73GB1C104K	CHIP C 0.10UF K	
C4			CK73HB1H471K	CHIP C 470PF K	
C6			CK73HB1H471K	CHIP C 470PF K	
C7			CC73HCH1H0R5B	CHIP C 0.5PF B	
C8		*	CC73HCH1H070C	CHIP C 7.0PF C	
C9			CC73HCH1H0R5B	CHIP C 0.5PF B	

PARTS LIST

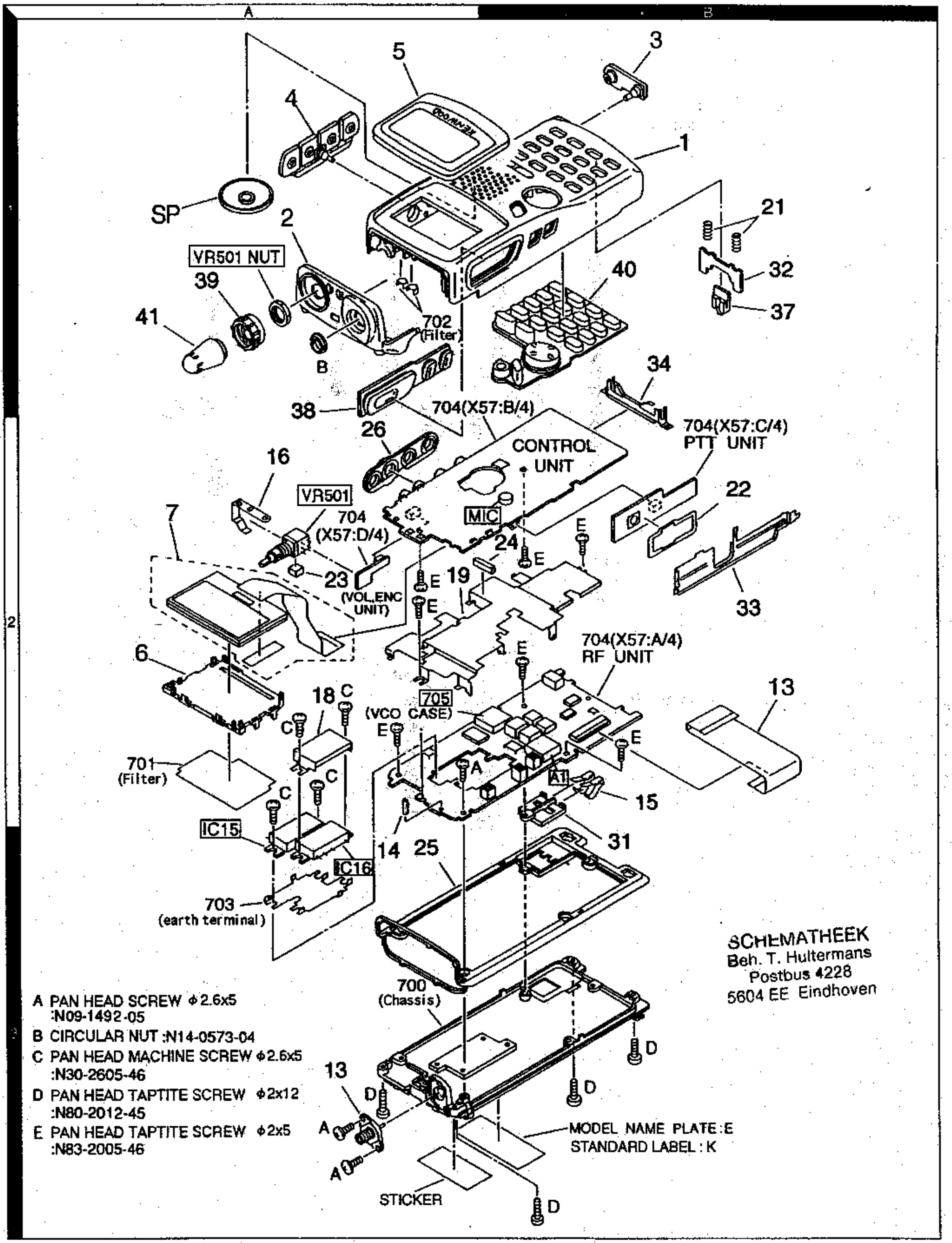
-RX UNIT (X57-570X-XX)

ef. No.	Adress	New parts	Parts No.	Description	Destination
8			CK73HB1H471K	CHIP C 470PF K	
1			CC73HCH1H0R5B	CHIP C 0.5PF B	
2			CC73HCH1H150J	CHIP C 15PF J	
3			CK73GB1C104K	CHIP C 0.10UF K	
4 ,15			CK73HB1H471K	CHIP C 470PF K	
7			CK73HB1H471K	CHIP C 470PF K	
		*	F10-2276-04	SHIELDING CASE	
			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
			L40-2275-77	SMALL FIXED INDUCTOR(22NH)	
			L40-2778-53	SMALL FIXED INDUCTOR(27NH)	
			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
			L40-1078-53	SMALL FIXED INDUCTOR(10NH)	
,2			RK73HB1J470J	CHIP R 47 J 1/16W	
,4			RK73HB1J473J	CHIP R 47K J 1/16W	
i			RK73HB1J471J	CHIP R 470 J 1/16W	
i			RK73HB1J222J	CHIP R 2.2K J 1/16W	
			RK73HB1J103J	CHIP R 10K J 1/16W	
			RK73HB1J104J	CHIP R 100K J 1/16W	
0			RK73HB1J823J	CHIP R 82K J 1/16W	
1			RK73HB1J103J	CHIP R 10K J 1/16W	
2			RK73HB1J682J	CHIP R 6.8K J 1/16W	
3			RK73HB1J181J	CHIP R 180 J 1/16W	
4			RK73HB1J103J	CHIP R 10K J 1/16W	
			HSC277	DIODE	
,3			1SV273	VARIABLE CAPACITANCE DIODE	
			2SC5108(Y)	TRANSISTOR	
			2SC5006	TRANSISTOR	
			2SC4997	TRANSISTOR	

SUB UNIT(UHF VCO) (X58-460X-XX)

Ref. No.	Adress	New parts	Parts No.	Description	Destination

EXPLODED VIEW



A PAN HEAD SCREW φ2.6x5 :N09-1492-05

B CIRCULAR NUT :N14-0573-04

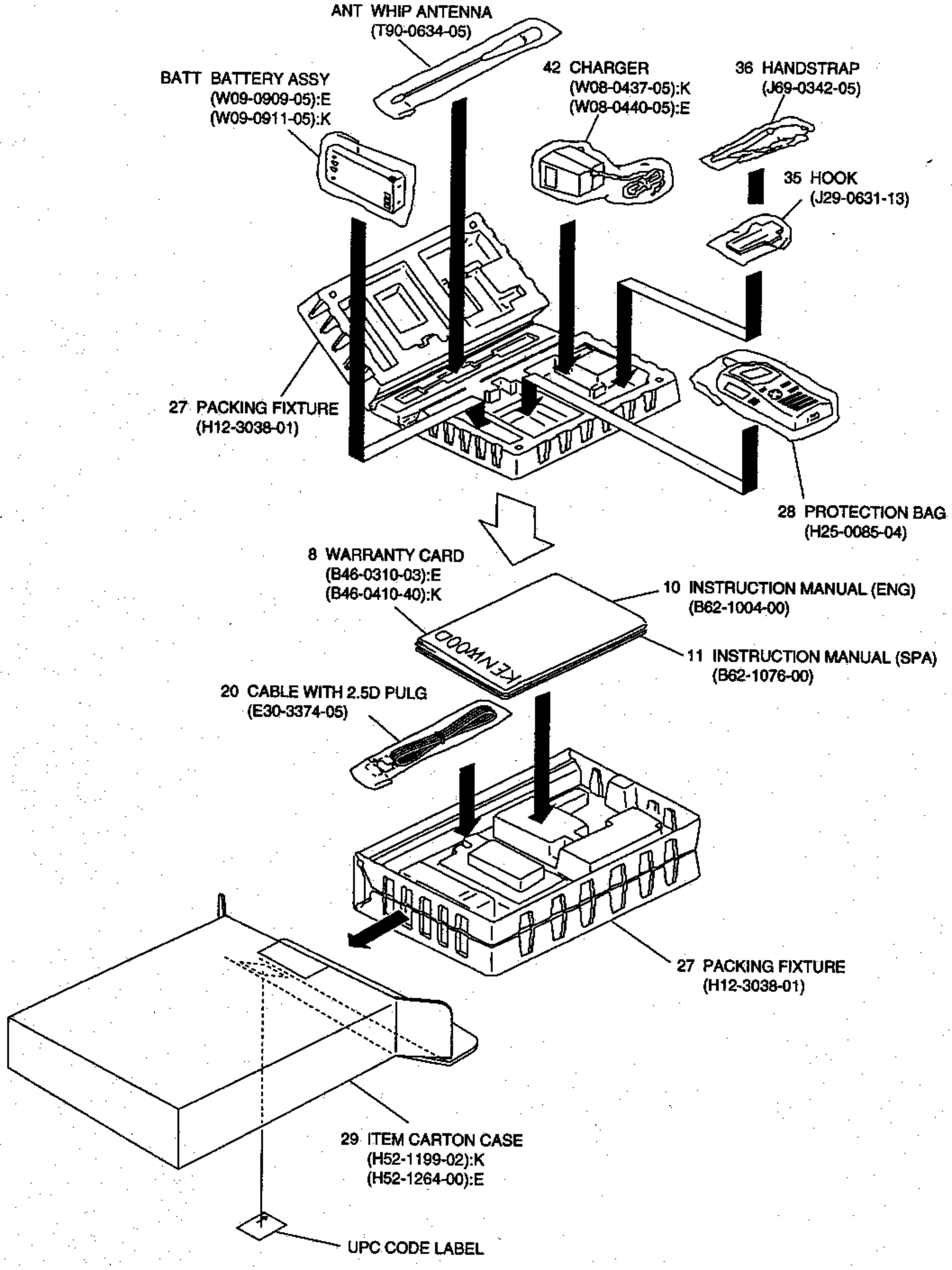
C PAN HEAD MACHINE SCREW φ2.6x5 :N30-2605-46

D PAN HEAD TAPTITE SCREW φ2x12 :N80-2012-45

E PAN HEAD TAPTITE SCREW φ2x5 :N83-2005-46

Parts with exploded numbers larger than 700 are not suppied.

PACKING


ANT WHIP ANTENNA
(T90-0634-05)
BATT BATTERY ASSY
(W09-0909-05):E
(W09-0911-05):K
42 CHARGER
(W08-0437-05):K
(W08-0440-05):E
36 HANDSTRAP
(J69-0342-05)
35 HOOK
(J29-0631-13)
27 PACKING FIXTURE
(H12-3038-01)
28 PROTECTION BAG
(H25-0085-04)
8 WARRANTY CARD
(B46-0310-03):E
(B46-0410-40):K
10 INSTRUCTION MANUAL (ENG)
(B62-1004-00)
11 INSTRUCTION MANUAL (SPA)
(B62-1076-00)
KENWOOD
20 CABLE WITH 2.5D PULG
(E30-3374-05)
27 PACKING FIXTURE
(H12-3038-01)
29 ITEM CARTON CASE
(H52-1199-02):K
(H52-1264-00):E
UPC CODE LABEL

ADJUSTMENT

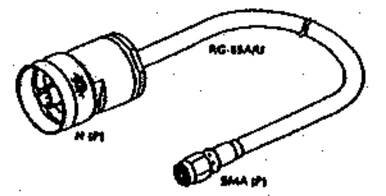
REQUIRED TEST EQUIPMENT

1. **Stabilized Power Supply**
   ①The supply voltage can be changed between 3V and 16V and the current is 1A or more.
   ②The standard voltage is 13.8V.
2. **DC Ammeter (DC.A)**
   ①Class 1 ammeter (17 ranges and other features)
   ②The full scale can be switched between 300mA and 3A.
   ③A cable with low internal loss must be used.
3. **Frequency Counter (f. counter)**
   ①Frequencies of up to 1 GHz or so can be measured.
   ②The sensitivity can be changed to 250 MHz or below and measurements are highly stable and accurate (about 0.2 ppm).
4. **Power Meter (terminal type)**
   ①Measurable frequency: Up to 500 MHz
   ②Impedance: 50Ω, unbalanced
   ③Measuring range: Full scale of 10W
   ④The specified special connection cable must be used.
5. **RF VTVM (RF V.M)**
   ①Measurable frequency: Up to 500 MHz or so
6. **Linear Detector**
   ①Measurable frequency: Up to 500 MHz
   ②Characteristic is flat and CN is 60 dB or more.
7. **Digital Voltmeter**
   ①Voltage range: FS = 18V or so
   ②Input resistance: 1MΩ or more
8. **Oscilloscope**
   ①Measuring range: DC to 30 MHz
   ②Provides highly accurate measurements for 5 to 25 MHz
9. **AF Voltmeter (AF V.M)**
   ①Measurable frequency: 50 Hz to 1 MHz
   ②Maximum sensitivity: 1mV or more
10. **Spectrum Analyzer**
    ①Measuring range: DC to 1GHz or more
11. **Standard Signal Generator (SSG)**
    ①Maximum frequency: 500MHz or more
    ②Output: -133 dBm (0.05 μV) to -13 dBm (50mV)
    ③Output impedance: 50Ω
12. **Tracking Generator**
    ①Center frequency: 50 kHz to 200 MHz
    ②Frequency deviation: ±35 MHz
    ③Output voltage: 100 mV or more
13. **Dummy Load**
    ①8Ω, 3W or more

Preparations

- Use a no-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils).
- To protect the SSG, do not send out signals while adjusting the receiving unit.
- The SSG output levels give the values are for maximum output. Also, unless otherwise specified, use the standard modulation (modulation: 1 kHz, deviation: ± 3 kHz).

Adjustment service jig



Antenna cable (length 1m)
(E30-3226-05)

Using the "SET mode"

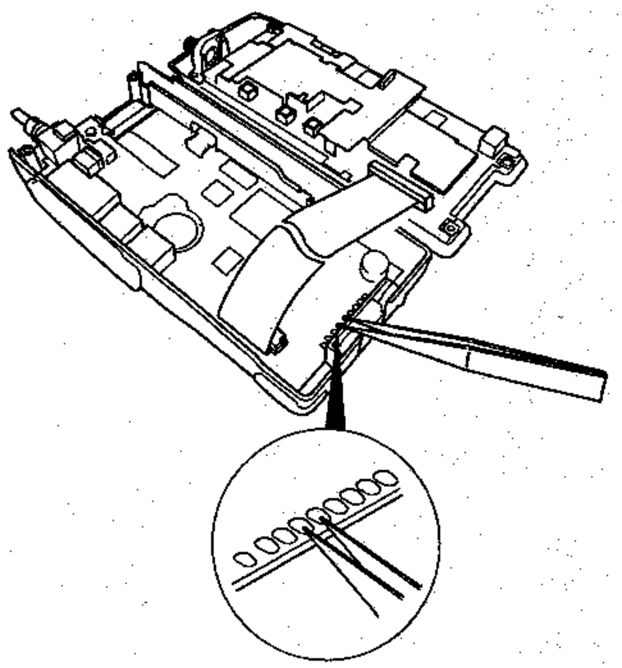
The SET mode is used to adjust the TH-D7A/E. In this mode, the following items can be set:

1. Squelch critical point in each band
2. First segment ON/all segments ON of the S meter in each band
3. Hi/Lo transmission output in each band
4. Reference voltage for overvoltage warning (13.8 V)

The levels set in the SET mode are written into the EEPROM. Therefore, the data stored in the EEPROM is retained after the power is shut down or reset.
If the EEPROM is replaced, all items must be written (set) into the new EEPROM.

Setting procedure

Open the main unit, turn the power on, and momentarily short the SET point on the component side of the TX-RX unit (B/4) (with tweezers, etc.). (See the figure below.)

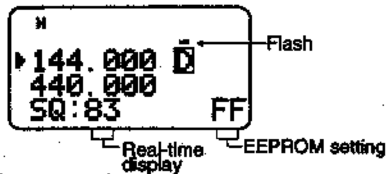


The beeper sounds and the ▬ mark on the display flashes to indicate that the SET mode is effective.

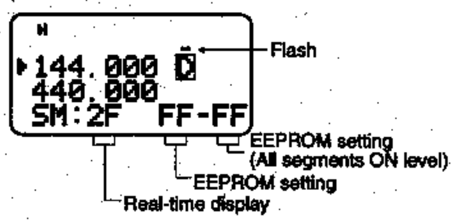
ADJUSTMENT

Operation

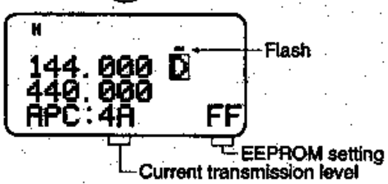
1. Setting the squelch critical point
   - Set the squelch adjustment screen on which 'SQ' is shown at the bottom of the display with the (▲▼) key, and select the band and frequency with the [BAND] key and encoder.
   - Send a prescribed signal to the ANT terminal from the SSG.
   - Press the (▶) key to set the squelch critical point.
   - Set the squelch critical point in all the receive bands in the same way.



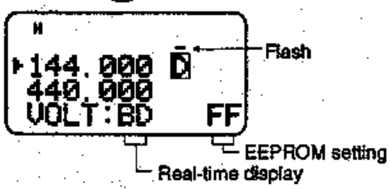
2. S meter setting
   - Set the S meter adjustment screen on which 'SM' is shown at the bottom of the display with the (▲▼) key, and select the band and frequency with the [BAND] key and encoder.
   - Send a prescribed signal to the ANT terminal from the SSG.
   - Set the first segment ON level with the (◀) key and set the all segments ON level with the (▶) key.
   - Set the levels in all the receive bands in the same way.



3. APC (RF power) setting
   - Set the RF power adjustment screen on which 'APC' is shown at the bottom of the display with the (▲▼) key, and select the band and frequency with the [BAND] key and encoder.
   - Connect the power meter to the ANT terminal, select HI/LO power with the [F] and [LOW] keys and press the [PTT] key.
   - Adjust the transmission power to the prescribed output using the (▲▼) key and encoder.
   - Press the (▶) key to set the selected value as the power.



4. Overvoltage warning reference voltage setting
   - Set the overvoltage warning reference voltage adjustment screen on which 'VOLT' is shown at the bottom of the display with the (▲▼) key.
   - Apply terminal voltage 13.8 V ± 0.05 V to the external power terminal (DC IN) from the stabilized power supply.
   - Press the (▶) key to set 13.8 V.



Prescribed input values

Enter the SSG level for each band from the ANT terminal and press the appropriate key. (See the table below.)

	SQ level	S1 level (First segment ON)	S9 level (All segments ON)
Key to press (CURSOR key) / Band (SSG frequency)	▶	◀	▶
VHF :145.820MHz	-126.0dBm	-120.0dBm	-105.0dBm
UHF 435.900MHz:E 444.000MHz:K	-126.0dBm	-120.0dBm	-105.0dBm
SUB•VHF:145.820MHz	-126.0dBm	-120.0dBm	-105.0dBm

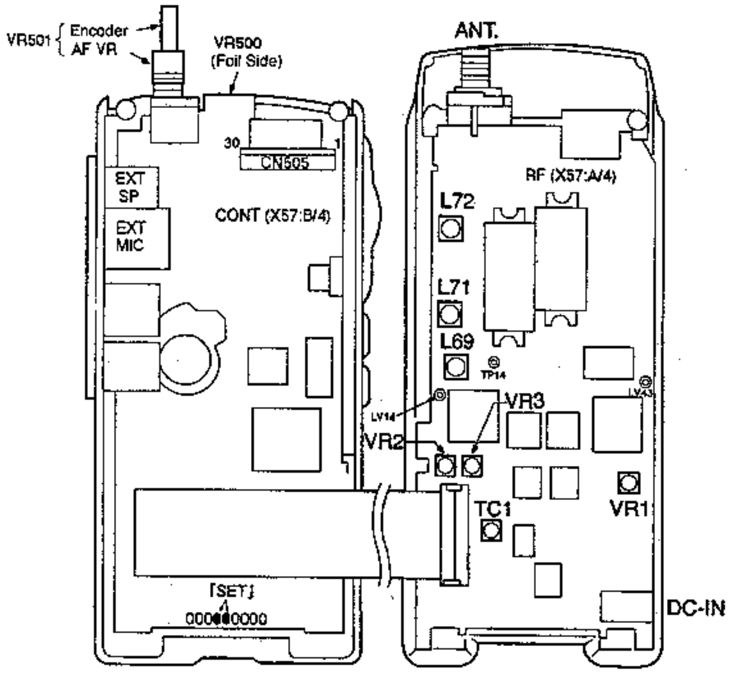
Note: SSG uses standard modulation.

Other information

1. The settings are overwritten on previous data, so they can be entered in any order and independently of each other.
2. The real-time display is updated every about 200 ms.
3. If an item is not set, "FF" is displayed on the EEPROM setting display.
4. In the SET mode, the expanded band can be recalled with the BAND key even if the receiver is not modified to extend the bands. However, the receiver extension is turned off when the SET mode is canceled.
5. Only the 118MHz band can be switched between FM and AM using the MENU key.
   (When AM is selected, the 'MHz dot' becomes a widened point.)
6. The SET mode is canceled when the power is turned off.
7. Finally, perform "VFO reset".

ADJUSTMENT

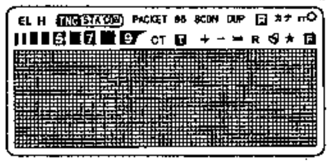
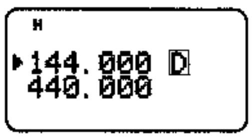
Adjustment Points



CONT UNIT (X57:B/4)
[SET] : SET mode test points.
VR500 : LCD Contrast
(Adjust only when replacing the LCD.)

RF UNIT (X57:A/4)
L69, 71, 72 : VHF Helical
TC1 : UHF transmit frequency
VR1 : UHF DEV
VR2 : VHF DEV (Wide):K
VR3 : VHF DEV (Narrow):E
TP14 : Helical alignment spectrum analyzer point
LV14 : VHF Lock voltage point
LV43 : UHF Lock voltage point

Section common to transmission and reception

Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting and reset	1) External power supply connection DC-IN terminal voltage: 13.8V 2) All-lit display check While pressing the F key, switch the POWER switch ON.	 LCD all-lit display						
	3) RESET Use Partial (VFO) Reset to initialize all settings except the memory channels, the Call channel, the DTMF channels, and Memory Channel Lockout. Use Full Reset to initialize all settings that you have customized.							
	3-1) Press [F]+ POWER ON. • "RESET?" appears. • You can also use Menu 1–5–7 (TH-D7A) or Menu 1–5–9 (TH-D7E).	 						
	3-2) Press [UP]/ [DWN] to select Partial (VFO) Reset or Full Reset.	 						
	3-3) Press [OK]. • A confirmation message appears.	 						
	3-4) Press [UP]/ [DWN] to select Yes (or No).							
	3-5) Press [OK].							Default setting display after all reset

ADJUSTMENT

Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
2. Lock voltage check	1) Frequency:144.050MHz During transmit and receive	Digital Voltmeter	RF	LV14			Check the voltage	0.7V or more
	2) Frequency:145.950MHz:E :147.950MHz:K During transmit and receive							5.8V or more
	3) Frequency:430.050MHz:E :438.050MHz:K During transmit and receive			LV43				0.7V or more
	4) Frequency:439.975MHz:E :449.975MHz:K During transmit and receive							6.0V or less
3. Adjust the LCD contrast	Only during LCD replacement Normally use Menu Mode 1-1-2.	Digital Voltmeter	CONT	CN505 (4 pin)	CONT	VR500 (Foil Side)	Alignment Method 1. Set for a maximum voltage (display gets darker). Set the voltage at that time as V max (V). 2. Temporarily return to the minimum voltage (display gets lighter) and then align V max to -0.001(V).	

VHF reception section

Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Helical Adjust (BPF)	1) Tracking generating output: -35dBm Center: 145.050 MHz Span:20MHz	Tracking generator Spectrum analyzer	RF	ANT TP	RF	L69 L71 L72	Repeat 2~3 times for maximum level	See Figure 1.
2. Large input S/N check	1) Frequency:145.020 MHz:E 146.020 MHz:K SSG:-53dBm	SSG Oscilloscope AFVM		ANT SP			S/N check (AF-VR:0.63V/8Ω)	35 dB or more.
3. Sensitivity Check	1) Frequency:144.020MHz SSG:-121dBm AF - VR:0.63V/8 Ω 2) Frequency:145.020MHz:E 146.020MHz:K 3) Sub•VHF Frequency:145.05MHz:E Frequency:146.05MHz:K SSG :-117dBm	Distortion meter Ammeter Dummy load					Check	12dB SINAD or more.
4. S meter Check	1) Frequency:144.020MHz SSG:-120dBm±6dBm	SSG Oscilloscope		ANT SP		LCD	Check	At least one lit
	2) SSG:-105dBm±6dBm							5 7 9 All lit
5. Squelch Check	1) Frequency:144.020MHz SSG:OFF						Check	Squelch must be closed.
	2) SSG:-122.5dBm							Squelch must be opened.

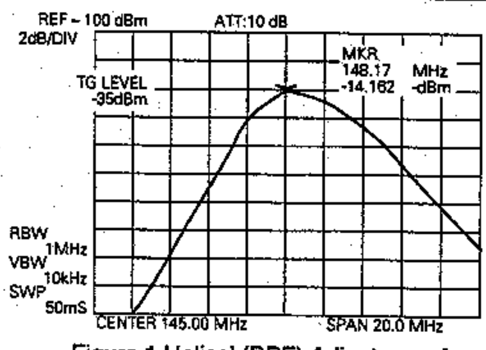
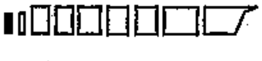


Figure 1 Helical (BPF) Adjust waveform

ADJUSTMENT

UHF reception section

Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Large input S/N check	1) Frequency:430.025MHz:E :440.025MHz:K SSG:-53dBm AF•VR:0.63V/8 Ω	SSG Oscilloscope AFVM Distortion	RF	ANT SP			Check	40dB or more.
2. Sensitivity Check	1) Frequency:430.025MHz:E :440.025MHz:K SSG:-121dBm 2) Frequency:435.025MHz:E :445.025MHz:K	meter Ammeter Dummy load					Check	12dB SINAD or more.
3. S meter Check	1) Frequency:430.025MHz:E :440.025MHz:K SSG:-121dBm±6dBm	SSG Oscilloscope		ANT SP		LCD	Check	 At least one lit
	2) SSG:-105dBm±6dBm							 All lit
4. Squelch Check	1) Frequency:435.025MHz:E :445.025MHz:K SSG:OFF						Check	Squelch must be closed.
	2) SSG:-122.5dBm							Squelch must be closed.

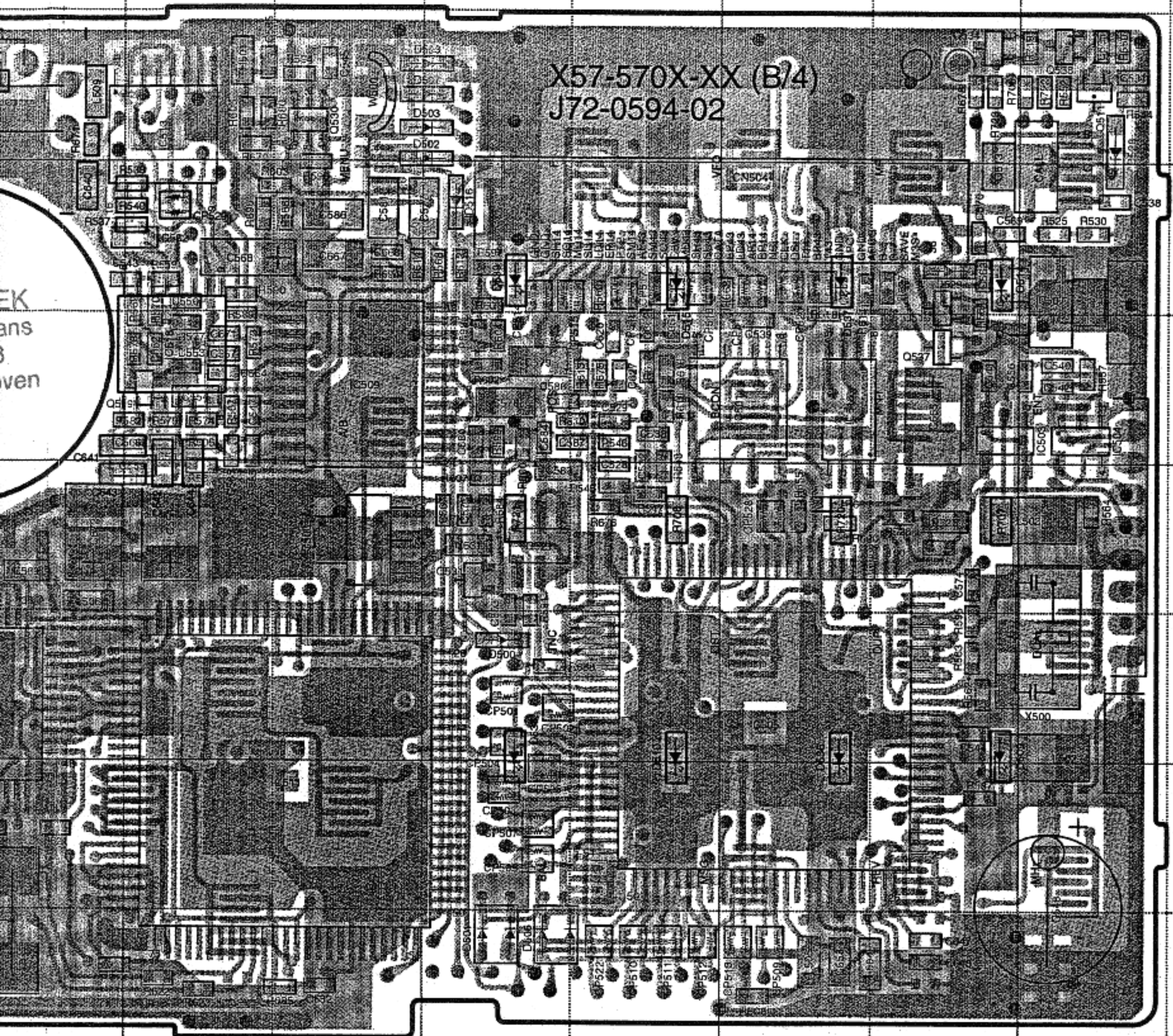
UHF transmission section

Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission frequency Adjust	1) Frequency:434.980MHz:E :449.980MHz:K PTT:ON	Power meter F counter	RF	ANT	RF	TC1	Set to display frequency	±200Hz
2. Transmission output Adjust	1) DC-IN:13.8V Frequency:435.050MHz:E :445.050MHz:K Set to SET MODE	Power meter DC-A		ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 4.8 W.	±0.1W
	2) Transmission output switching:HI PTT transmission Press the set key. Return to PTT.							(Less than:2.1A)
	3) Transmission output switching : LO Same method as 2)						Adjust to 0.5W	±0.1W (Less than 0.8A)
	4) Transmission output switching: EL Same method as 2)						Adjust to 50mW	±10mW (Less than 0.5A)
3.DEV Adjust	1) Frequency:434.975MHz:E :444.000MHz:K AG:1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	RF	VR1	Adjust to 4.2 kHz with larger ±.	±100Hz
	2) AG:20dBm down:1 kHz/7 mV PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	±1.8~2.6kHz

ADJUSTMENT

VHF transmission section

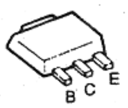
Item	Conditions	Measurement			Adjustment			Specifications/Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission output Adjust	1) DC-IN:13.8V Frequency:145.060MHz:E :146.060MHz:K Set to Set mode.	Power meter DC-A	RF	ANT	Panel	Display encoder	Turn the encoder and adjust the power meter reading to 4.8W.	±0.1W
	2) Transmission output switching: HI PTT transmission Press the set key. Return to PTT.							(Less than 1.8A)
	3) Transmission output switching: LO Same method as 2)						Adjust to 0.5W	±50mW (Less than 0.8A)
	4) Transmission output switching: EL Same method as 2)						Adjust to 50mW	±10mW (Less than 0.5A)
2.DEV Adjust	1) Frequency:145.060MHz:E :146.060MHz:K AG:1kHz/70mV PTT:ON	Power meter Linear detector Oscilloscope		ANT	RF	VR2	K: Adjust to 4.2 kHz with larger ±.	±100Hz
						VR3	E: Adjust to 2.1 kHz	
	2) AG: 20dB down: (1 kHz/7 mV) PTT:ON	AG AFVM		MIC			Check (mic sensitivity)	±2.8~3.5kHz:K ±1.3~1.7kHz:E
3. DTMF DEV check	1) Frequency:145.975MHz:E :147.950MHz:K In transmitted state, press the D key.						DTMF DEV Check	±2.2~4.2kHz
4. TONE DEV check	1) Frequency:144.800MHz TONE Frequency:88.5Hz PTT:ON						TONE DEV Check	±0.4~1.2kHz



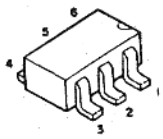
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(Component side) + (Foil side)

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IC512	8E
IC513	3K
IC514	7E
IC515	7H
IC516	5O
IC517	6F
IC518	5K
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Q538	3Q
Q539	6C
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D526	6F
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D539	4M

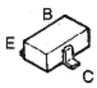
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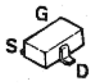
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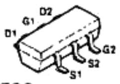
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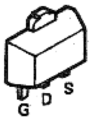
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UPA672T



2SK1588



● Connect 1 and 4.

Component side

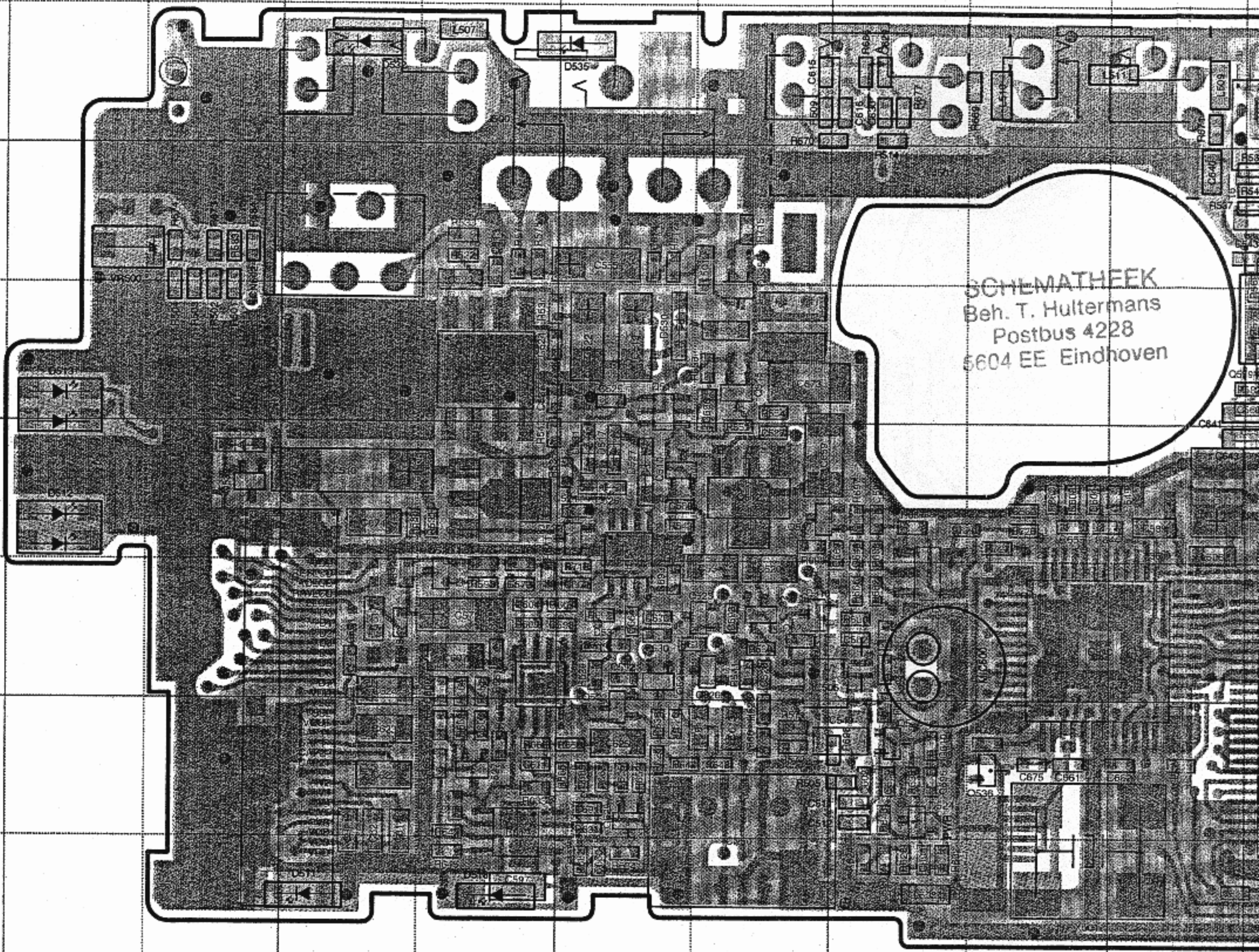
Pattern 1
Pattern 2
Pattern 3
Pattern 4



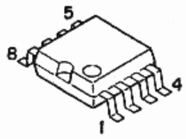
Foil side

TH-D7A/E PC BOARD VIEW

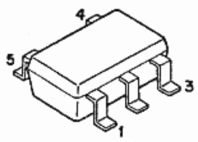
CONTROL UNIT (X57-570X-XX) (B/4) Component Side View + Foil Side View



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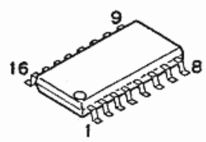
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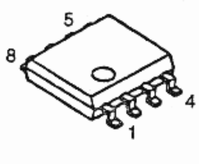


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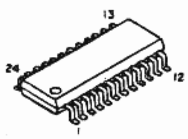


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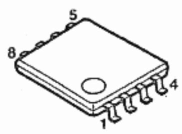


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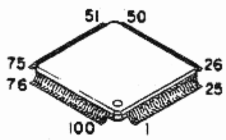


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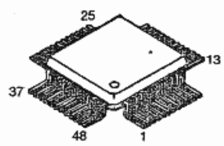
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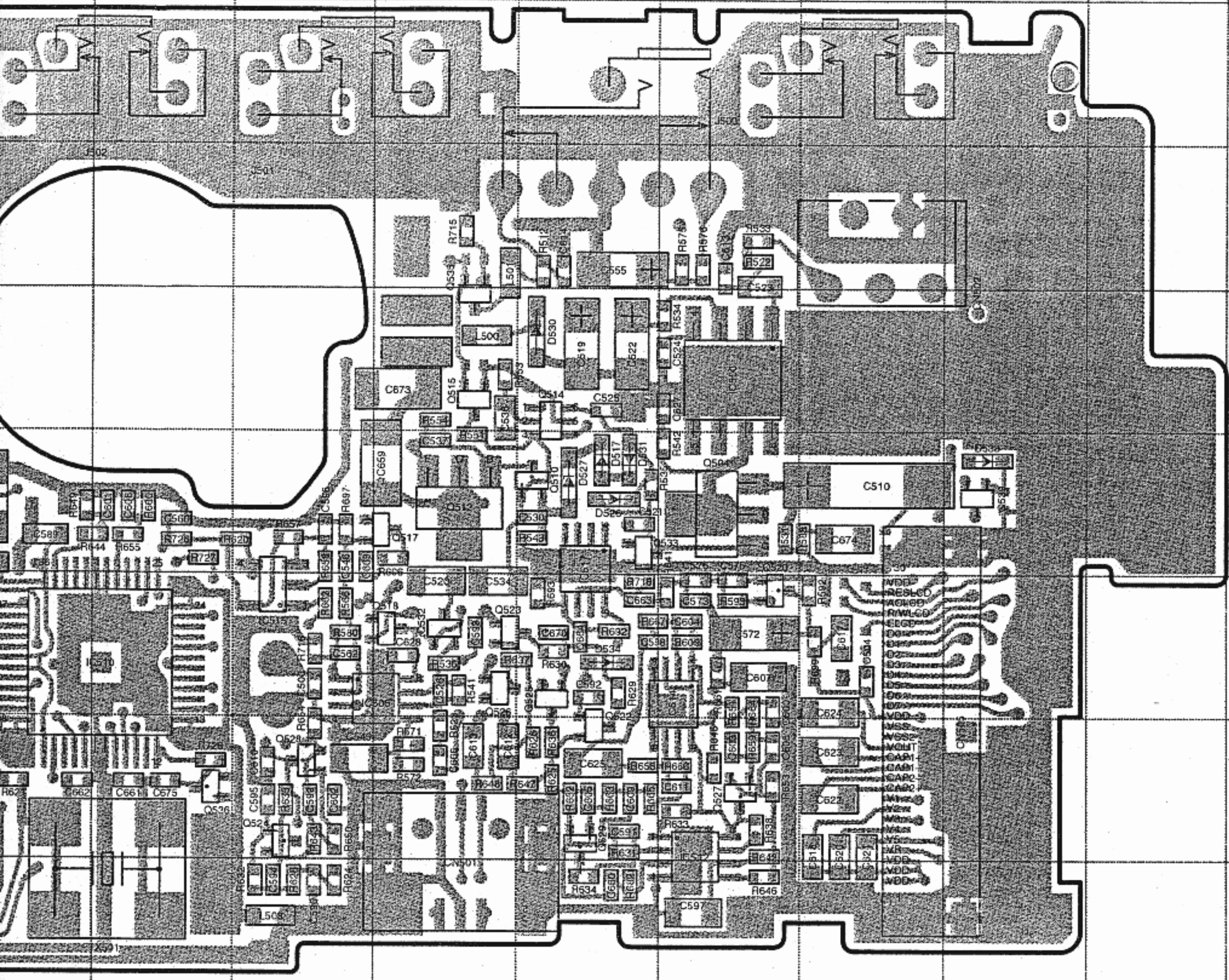
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DT
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2S

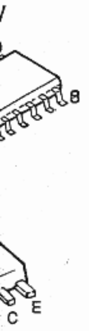
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PC BOARD VIEW TH-D7A/E

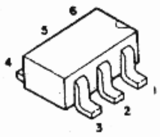


CONTROL UNIT (B/4)
(Foil side)

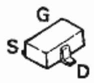
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IC516	5D
IC517	6M
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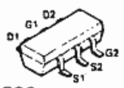
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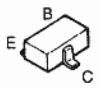
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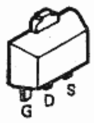
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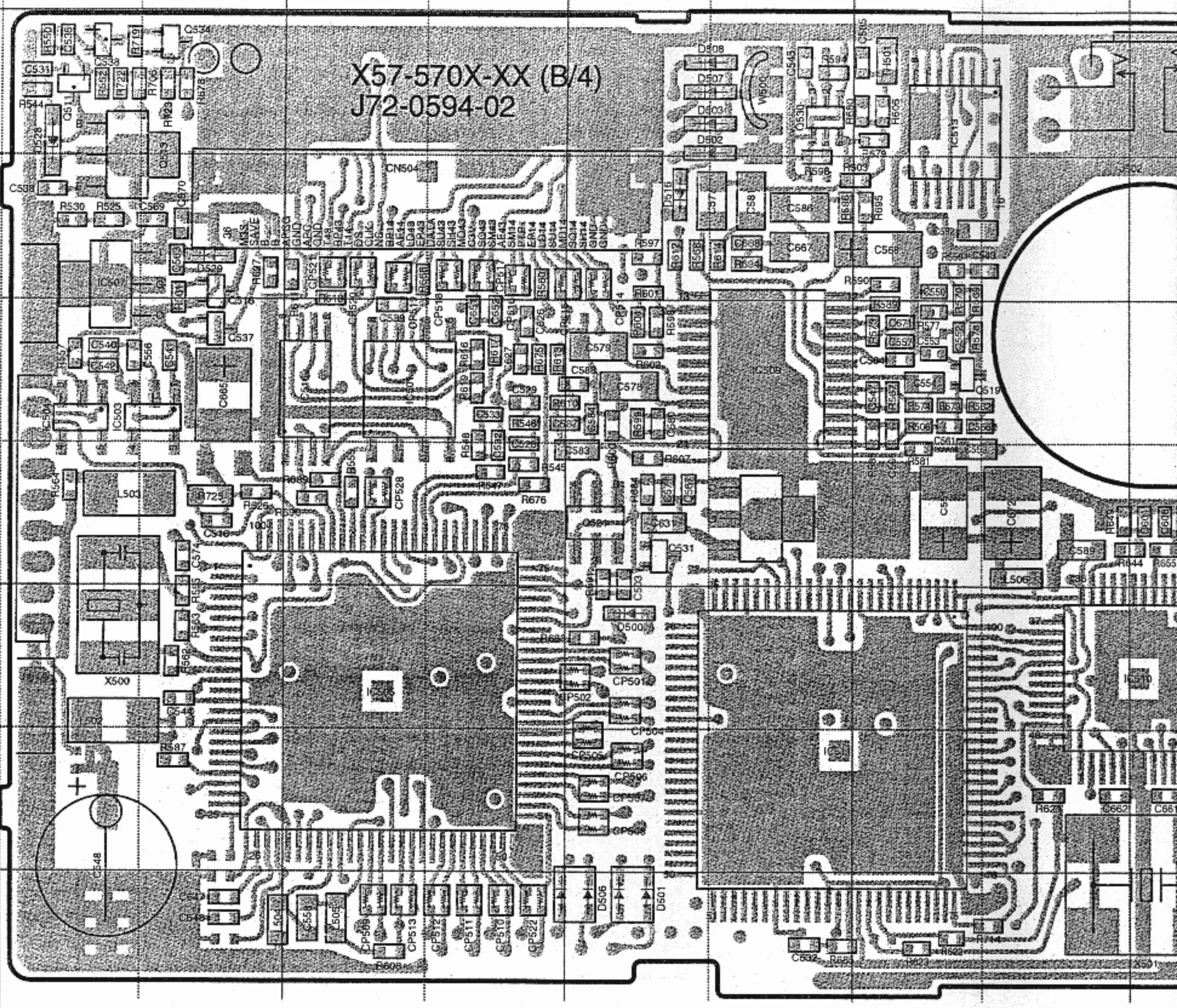
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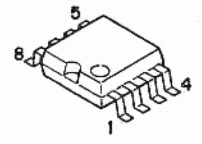
Component side
Pattern 1
Pattern 2
Pattern 3
Pattern 4
Foil side

A | B | C | D | E | F | G | H | I

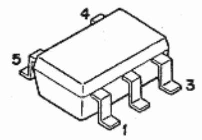
CONTROL UNIT (X57-570X-XX) (B/4) Foil Side View



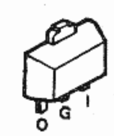
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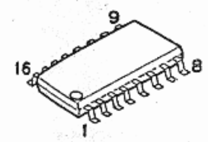
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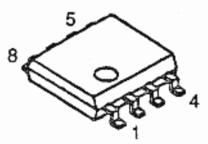
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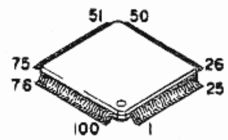
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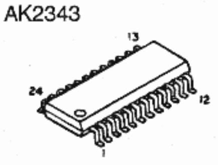
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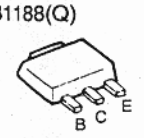
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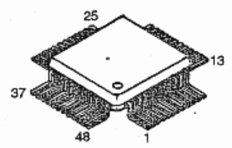
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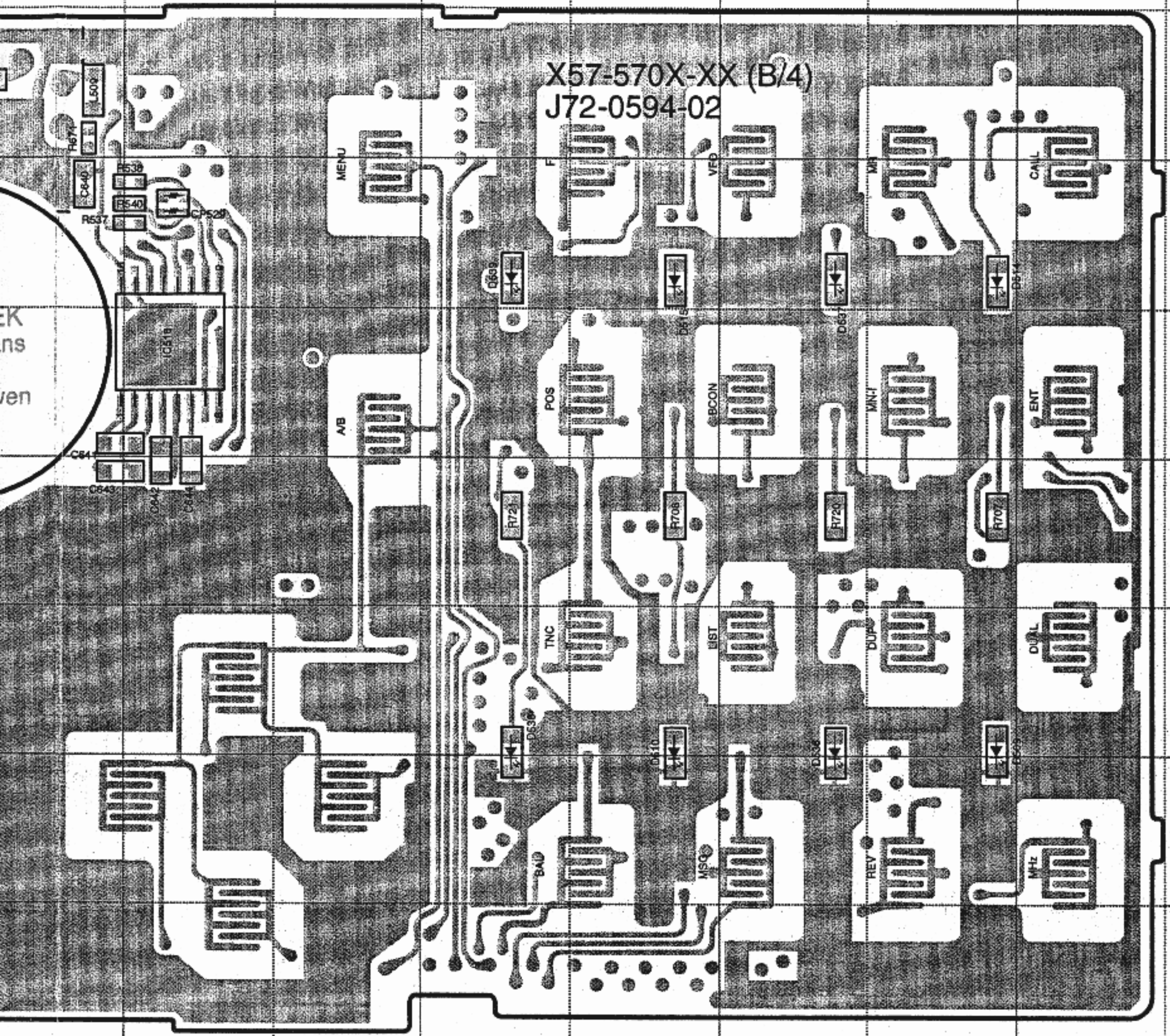
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TGT0120Q



J K L M N O P Q R S



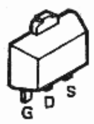
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2SK1824
2SJ243



2SK1588



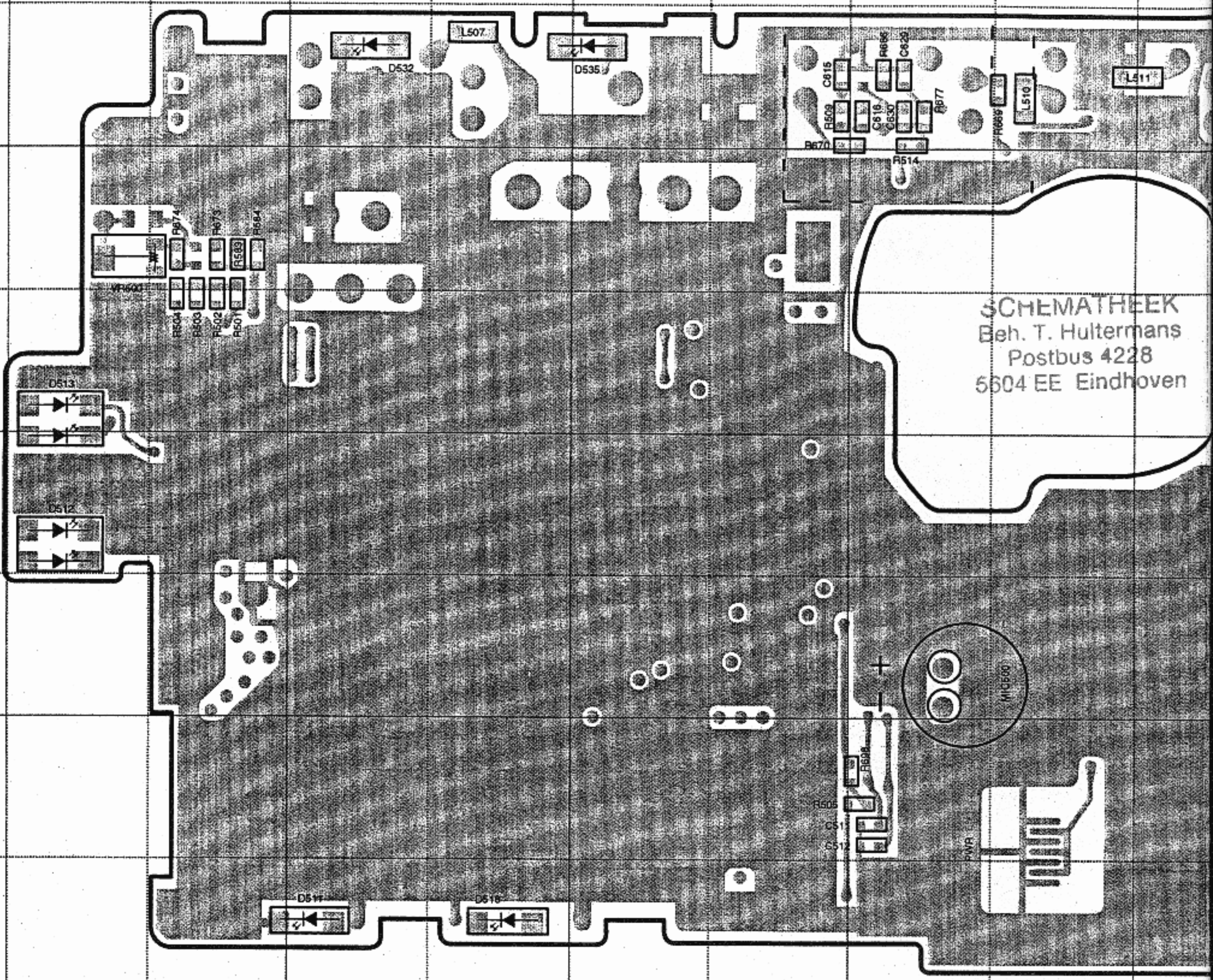
Component side

Pattern 1
Pattern 2
Pattern 3
Pattern 4

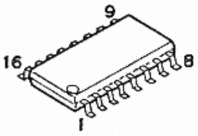
Foil side

TH-D7A/E PC BOARD VIEW

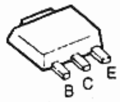
CONTROL UNIT (X57-570X-XX) (B/4) Component Side View



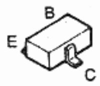
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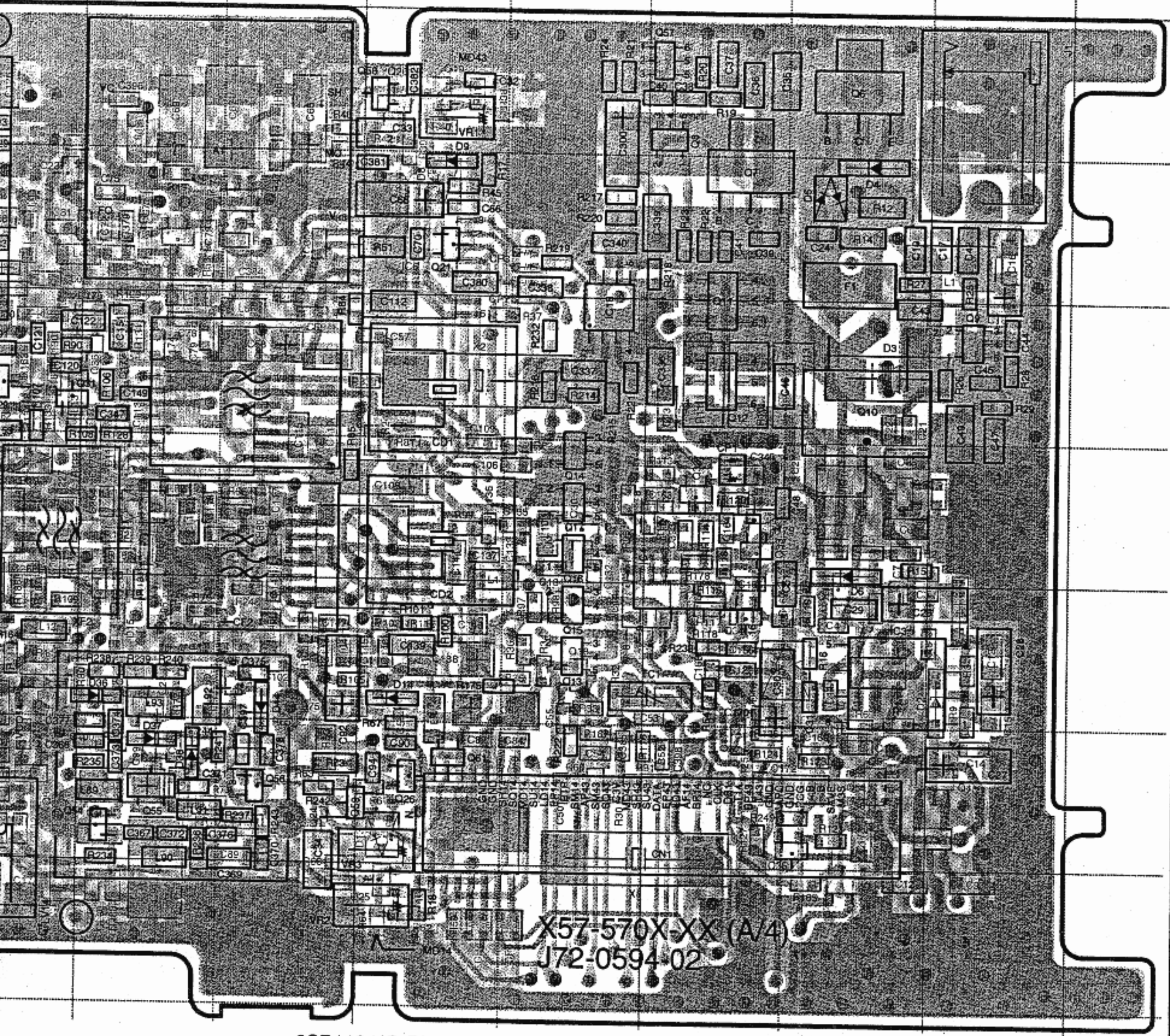


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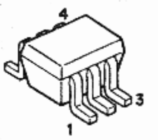
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PC BOARD VIEW TH-D7A/E

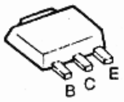


RF UNIT (A/4)
(Component side) + (Foil side)

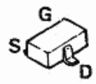
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IC2	7O	Q46	6I
IC3	7O	Q47	9H
IC4	6N	Q48	8H
IC6	4L	Q49	9E
IC7	4K	Q50	8I
IC9	8L	Q51	8I
IC10	8K	Q52	9F
IC12	5J	Q53	9F
IC13	6L	Q54	8J
IC14	7M	Q55	8J
IC15	5F	Q56	8K
IC16	7F	Q57	3N
IC17	9I	Q58	3L
IC18	5M	Q59	8K
Q1	7O	Q60	8M
Q2	6O	Q61	8L
Q3	8P	Q62	8E
Q4	8P	Q63	9E
Q5	8O	D1	7P
Q6	3O	D2	7P
Q7	4N	D3	5O
Q8	3N	D4	4O
Q9	5P	D5	4O
Q10	5O	D6	6O
Q11	4N	D8	4L
Q12	5N	D9	4L
Q13	7M	D10	5I
Q14	6M	D11	4I
Q15	7M	D12	4I
Q16	6M	D13	8L
Q17	6M	D14	7L
Q18	7M	D15	7J
Q19	3L	D17	7I
Q20	3L	D18	7N
Q21	4L	D19	6I
Q22	4J	D20	6C
Q23	3I	D21	5B
Q24	8K	D22	5C
Q25	9L	D23	4H
Q26	8L	D24	3H
Q27	7K	D25	3G
Q28	7J	D26	3E
Q29	5I	D27	3G
Q30	6M	D28	3F
Q31	5I	D29	6J
Q32	6N	D30	8D
Q33	6N	D31	9C
Q34	7N	D32	9H
Q35	8N	D33	9G
Q36	5J	D34	8F
Q37	5H	D36	7J
Q38	4H	D37	8J
Q39	4H	D38	8J
Q40	3C	D40	4D
		D42	4E
		D43	3H
		D44	7K

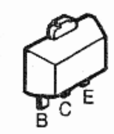


2SB1184(Q,R)

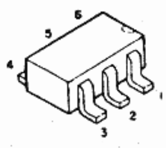


2SK1824
2SK1875(V)

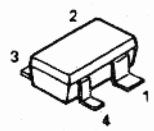


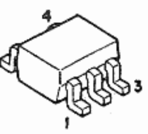


IMD16A

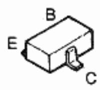


3SK309
3SK239A

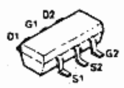




DTC144EE
DTC114YE
2SC4617(R)
2SC4617(S)
2SC4649(N,P)
2SC5108(Y)



UPA672T



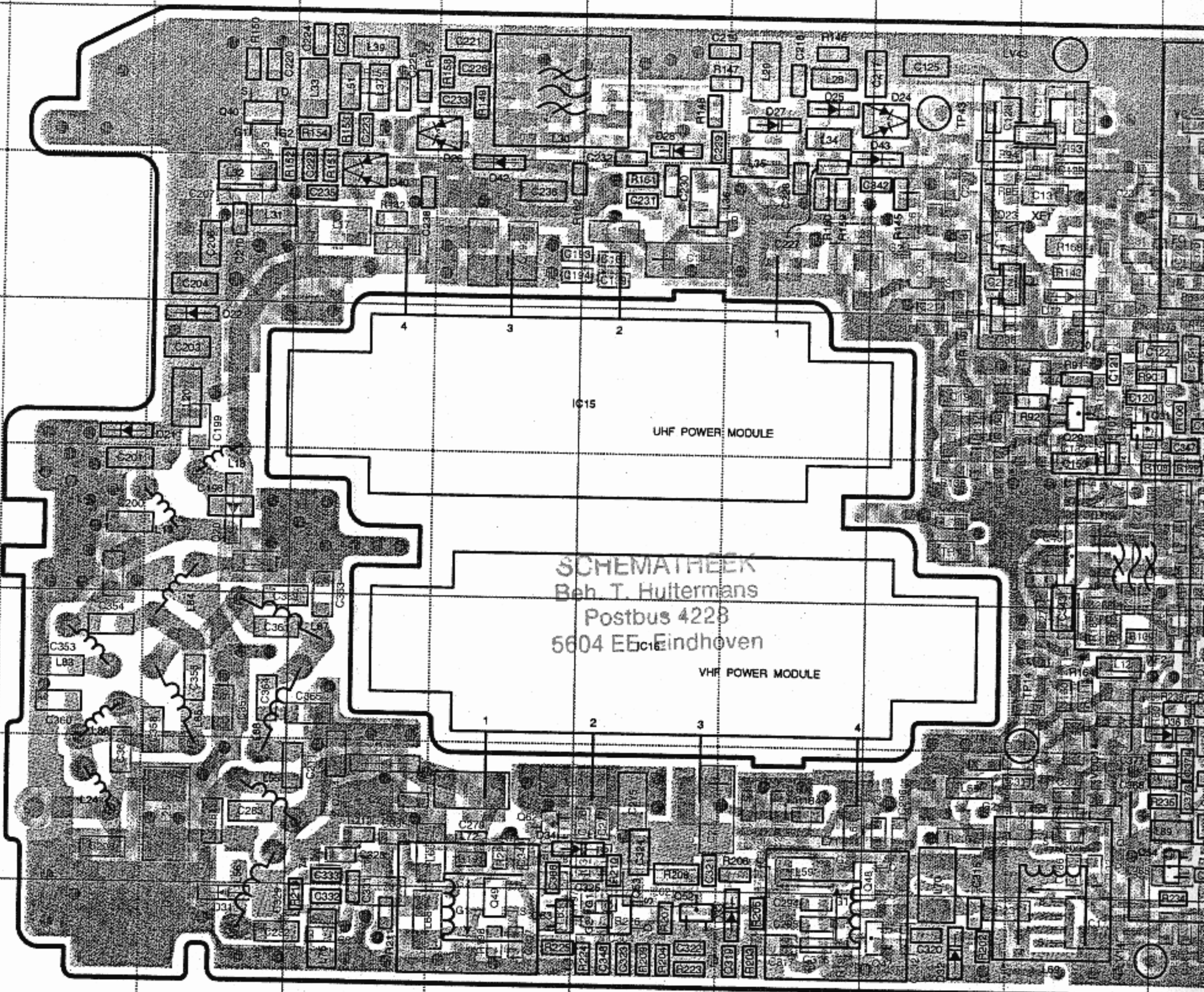
Connect 1 and 4.

Component side

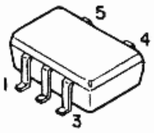


Foil side

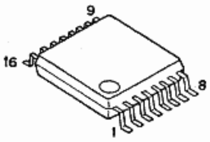
RF UNIT (X57-570X-XX) (A/4) Component Side View + Foil Side View



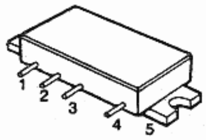
LMC7101BIM5



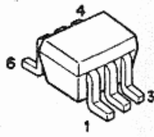
MB15E03L



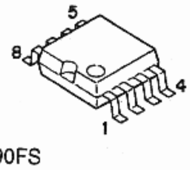
M67799MA



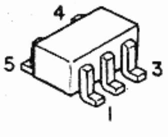
UMA10N
UMA11N



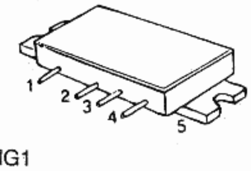
TC7660SEOA



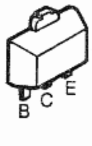
TC7S66FU



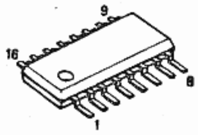
M67798LRA



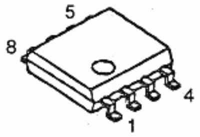
2SD1483



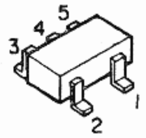
BU2090FS
TA31136FN



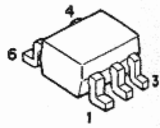
TC4W53FU
UPB1509GV
TA75W01FU



UMG1

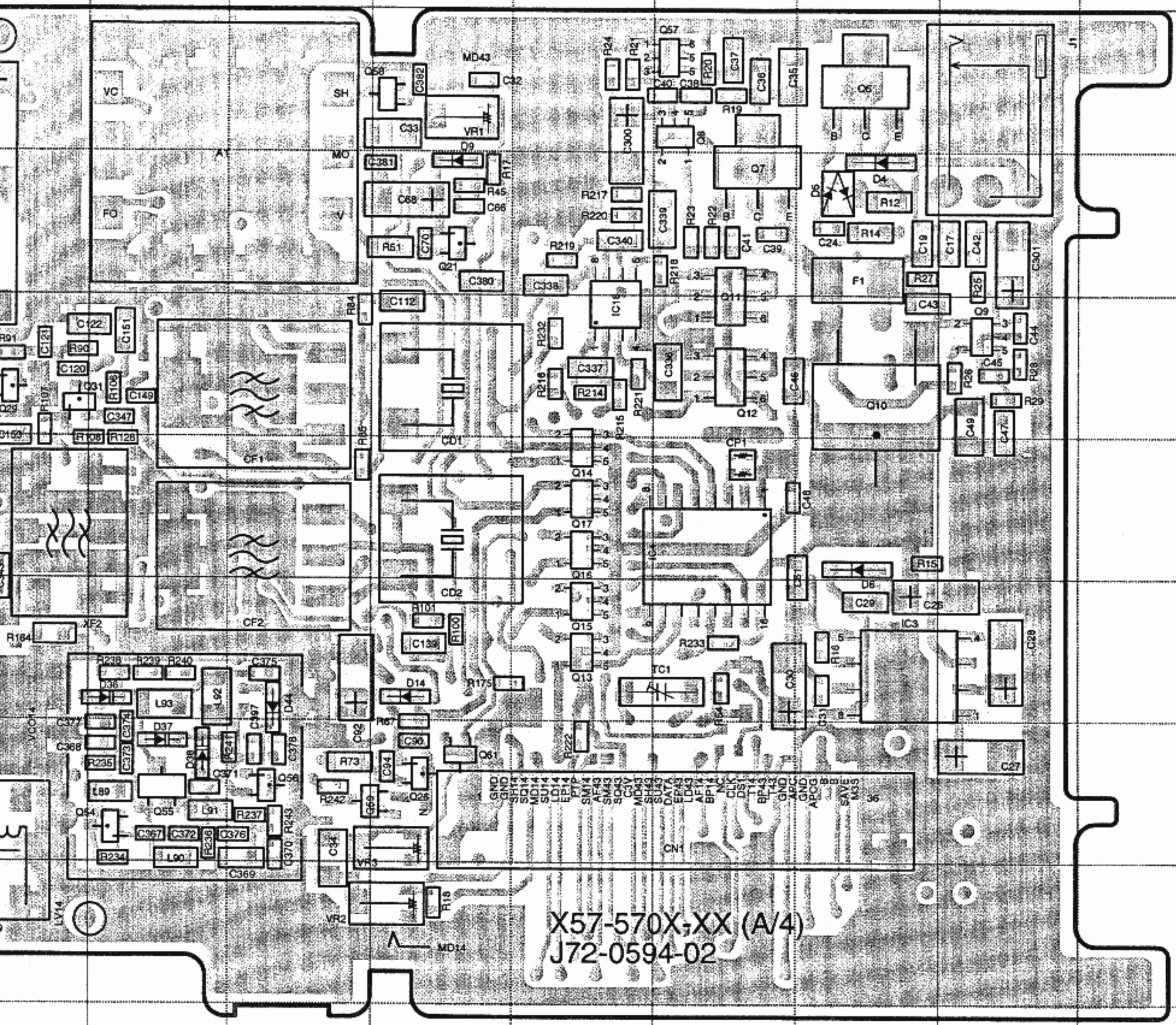


UMW1

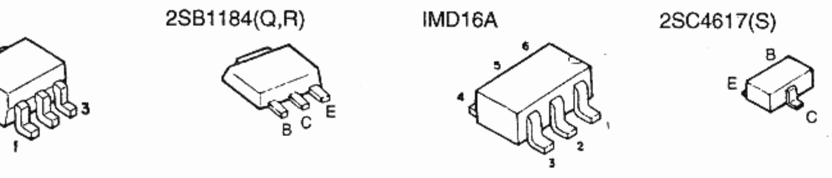


PC BOARD VIEW TH-D7A/E

RF UNIT (A/4) (Component side)



Ref. No.	Address
IC3	7O
IC4	6N
IC15	5F
IC16	7F
IC18	5M
Q6	3O
Q7	4N
Q8	3N
Q9	5P
Q10	5O
Q11	4N
Q12	5N
Q13	7M
Q14	6M
Q15	7M
Q16	6M
Q17	6M
Q21	4L
Q26	8L
Q29	5I
Q31	5I
Q40	3C
Q52	9F
Q53	9F
Q54	8J
Q55	8J
Q56	8K
Q57	3N
Q58	3L
Q59	8K
Q61	8L
Q63	9E
D4	4O
D5	4O
D6	6O
D9	4L
D14	7L
D21	5B
D22	5C
D24	3H
D25	3G
D26	3E
D27	3G
D28	3F
D32	9H
D33	9G
D34	8F
D36	7J
D37	8J
D38	8J
D40	4D
D42	4E
D43	3H
D44	7K



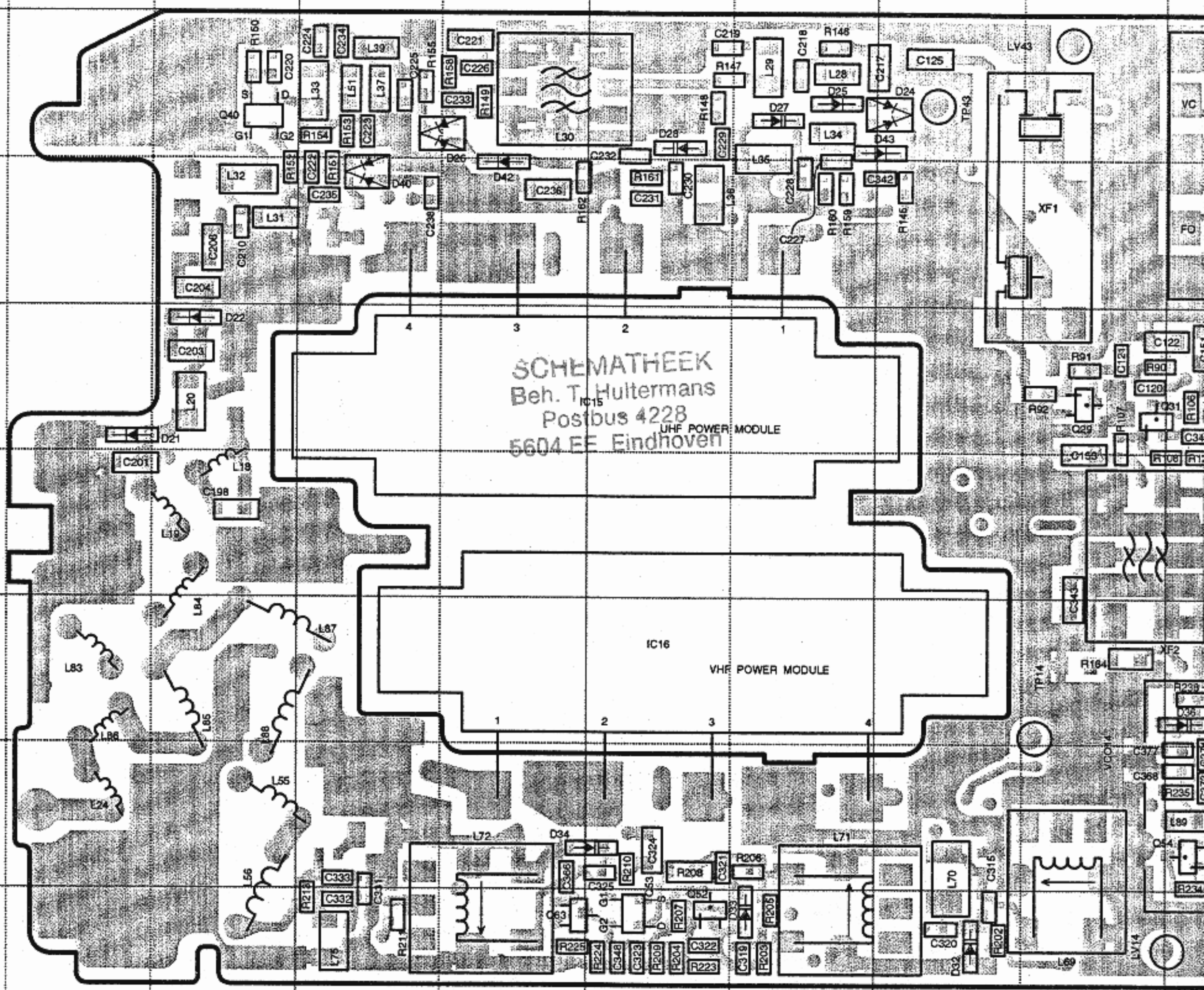
Component side

Pattern 1
Pattern 2
Pattern 3
Pattern 4

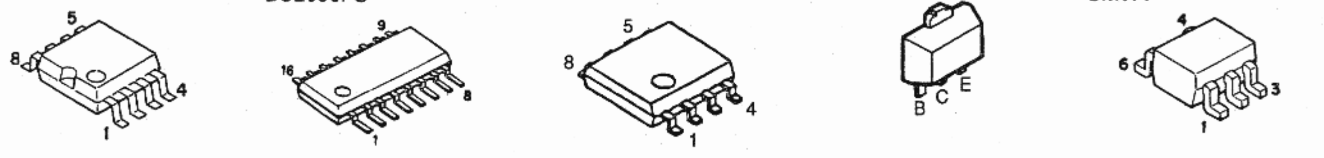
Foil side

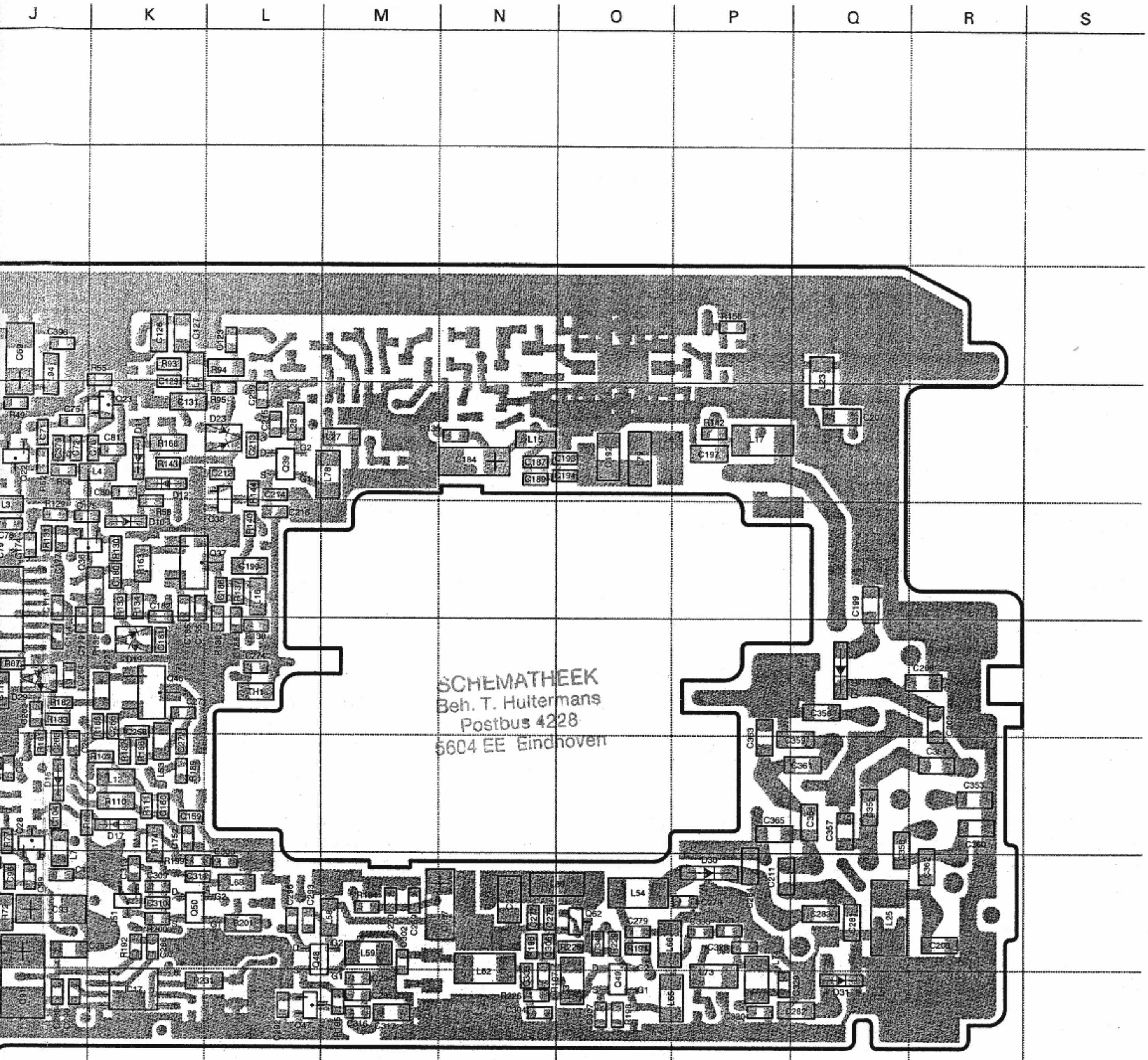
A B C D E F G H I

RF UNIT (X57-570X-XX) (A/4) Component Side View

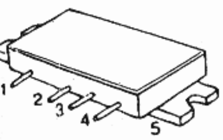


TC7660SEOA BU2090FS TA75W01FU 2SD1483 UMW1

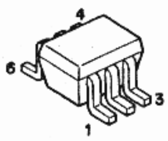




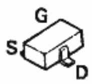
M67798LRA



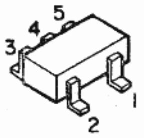
UMA11N



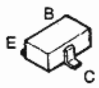
2SK1824



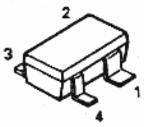
UMG1



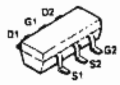
DTC144EE
2SC4617(R)
2SC4649(N,P)
2SC5108(Y)



3SK309
3SK239A

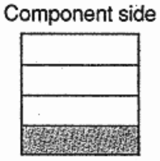


UPA672T



Component side

Pattern 1
Pattern 2
Pattern 3
Pattern 4



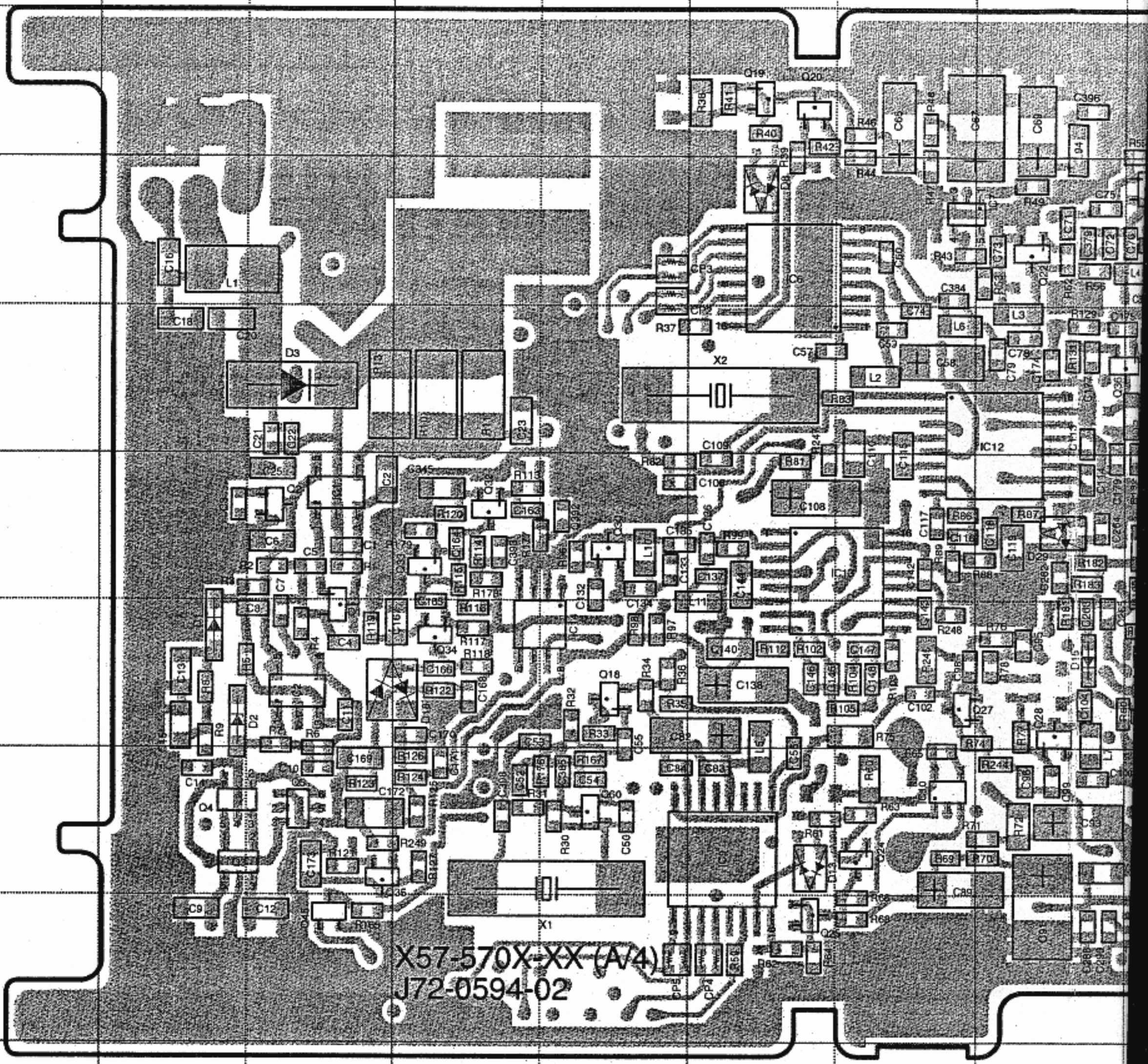
Foil side

TH-D7A/E **PC BOARD VIEW**

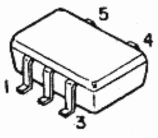
RF UNIT (A/4) (Foil side)

Ref. No.	Address
IC1	6E
IC2	7E
IC6	4H
IC7	4J
IC9	8H
IC10	8I
IC12	5J
IC13	6I
IC14	7G
IC17	9K
Q1	7E
Q2	6E
Q3	8E
Q4	8D
Q5	8E
Q18	7G
Q19	3H
Q20	3H
Q22	4J
Q23	4K
Q24	8I
Q25	9H
Q27	7I
Q28	7J
Q30	6G
Q32	6F
Q33	6F
Q34	7F
Q35	8E
Q36	5J
Q37	5K
Q38	5L
Q39	4L
Q45	9E
Q46	6K
Q47	9L
Q48	8L
Q49	9O
Q50	8K
Q51	8K
Q60	8G
Q62	8O
D1	7D
D2	7E
D3	5E
D8	4H
D10	5K
D11	4K
D12	4K
D13	8H
D15	7J
D17	7K
D18	7F
D19	6K
D20	6Q
D23	4L
D29	6J
D30	8P
D31	9Q

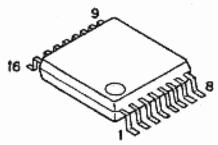
RF UNIT (X57-570X-XX) (A/4) Foil Side View



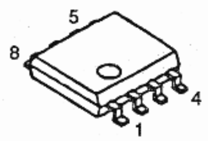
LMC7101BIM5



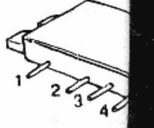
MB15E03L



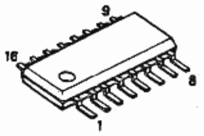
TC4W53FU
UPB1509GV



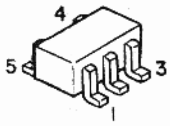
M67798LRA



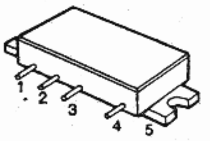
TA31136FN



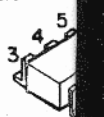
TC7S66FU



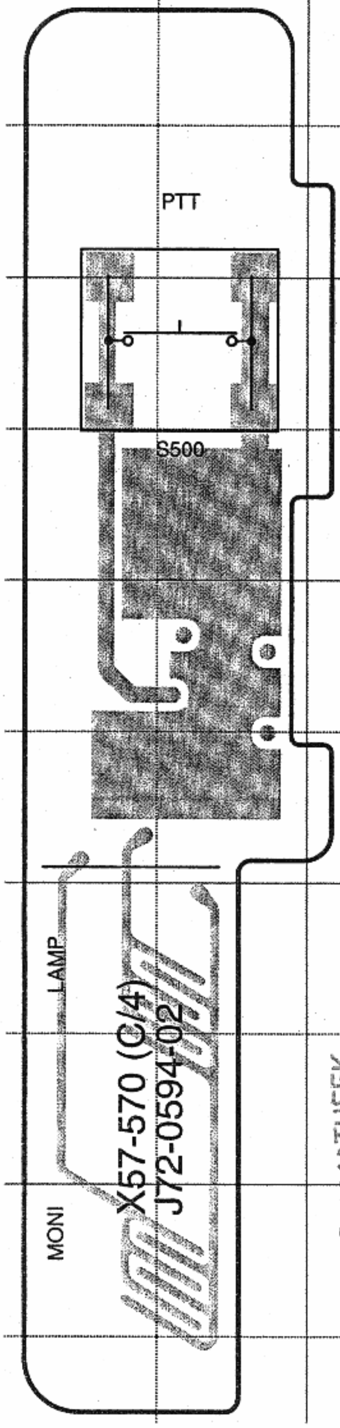
M67799MA



UMG1



PTT UNIT (X57-570X-XX) (C/4)
Component Side View

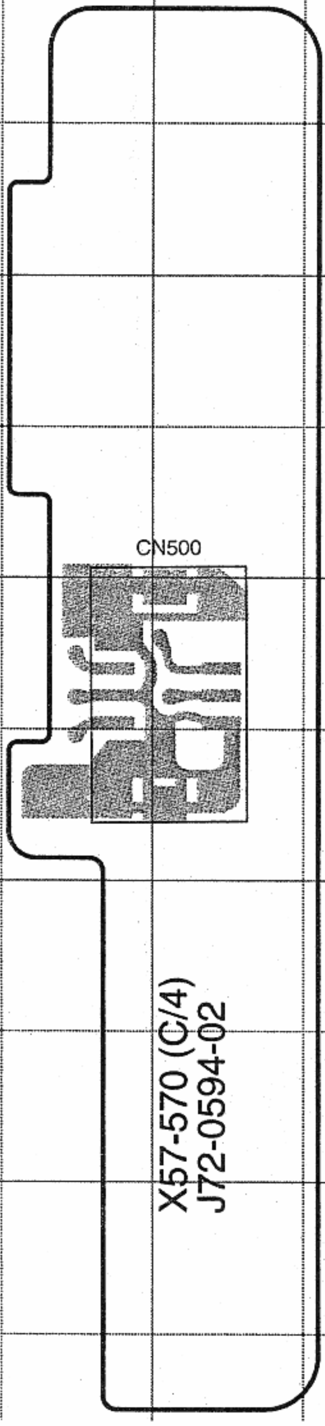


Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

PTT UNIT (X57-570X-XX) (C/4)
Foil Side View

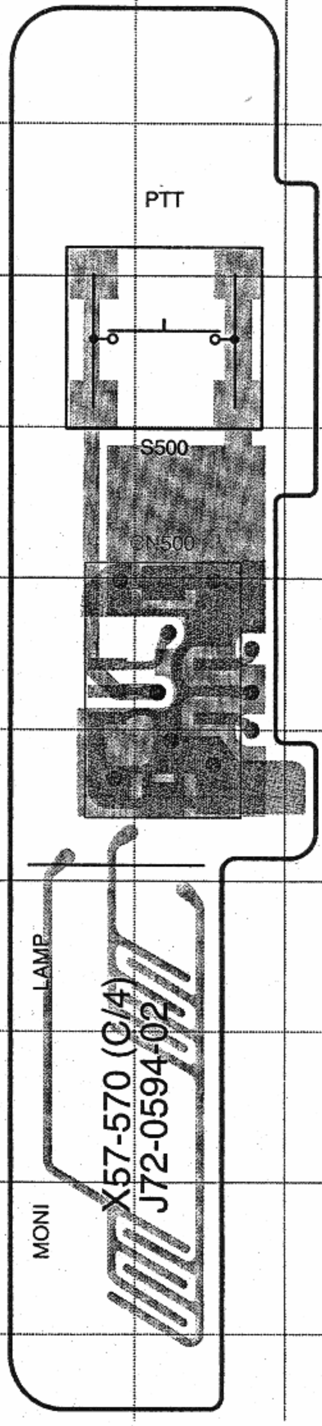


Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

PTT UNIT (X57-570X-XX) (C/4)
Component Side View + Foil Side View



● Connect 1 and 4.

Component side

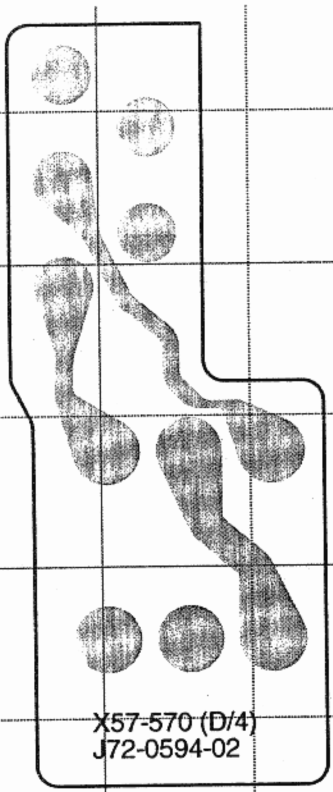
Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

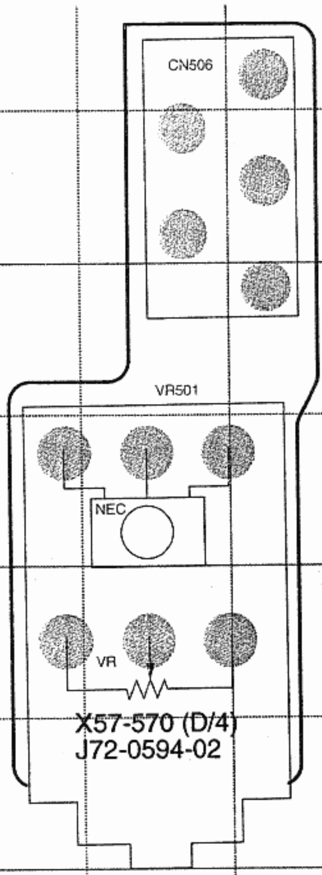
A B C D E F G H I

TH-D7A/E PC BOARD VIEW

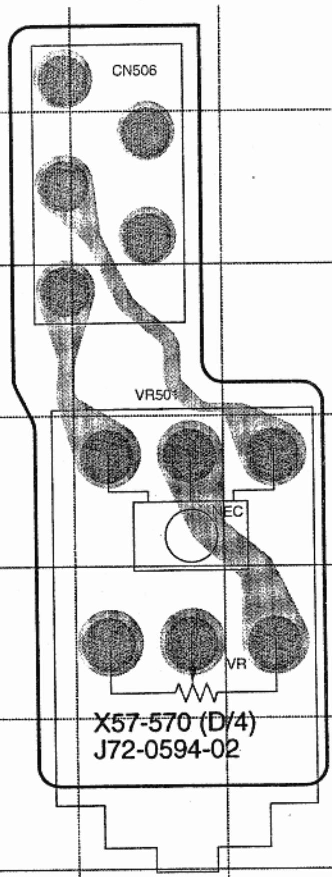
VOL, ENC UNIT (X57-570X-XX) (D/4) Component Side View



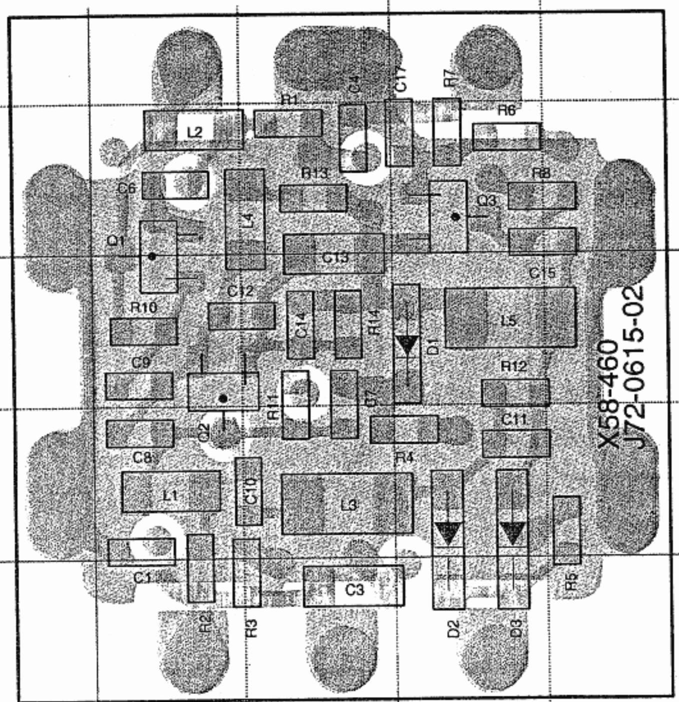
VOL, ENC UNIT (X57-570X-XX) (D/4) Foil Side View



VOL, ENC UNIT (X57-570X-XX) (D/4) Component Side View + Foil Side View



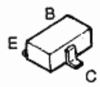
SUB UNIT (X58-460X-XX) Component Side View

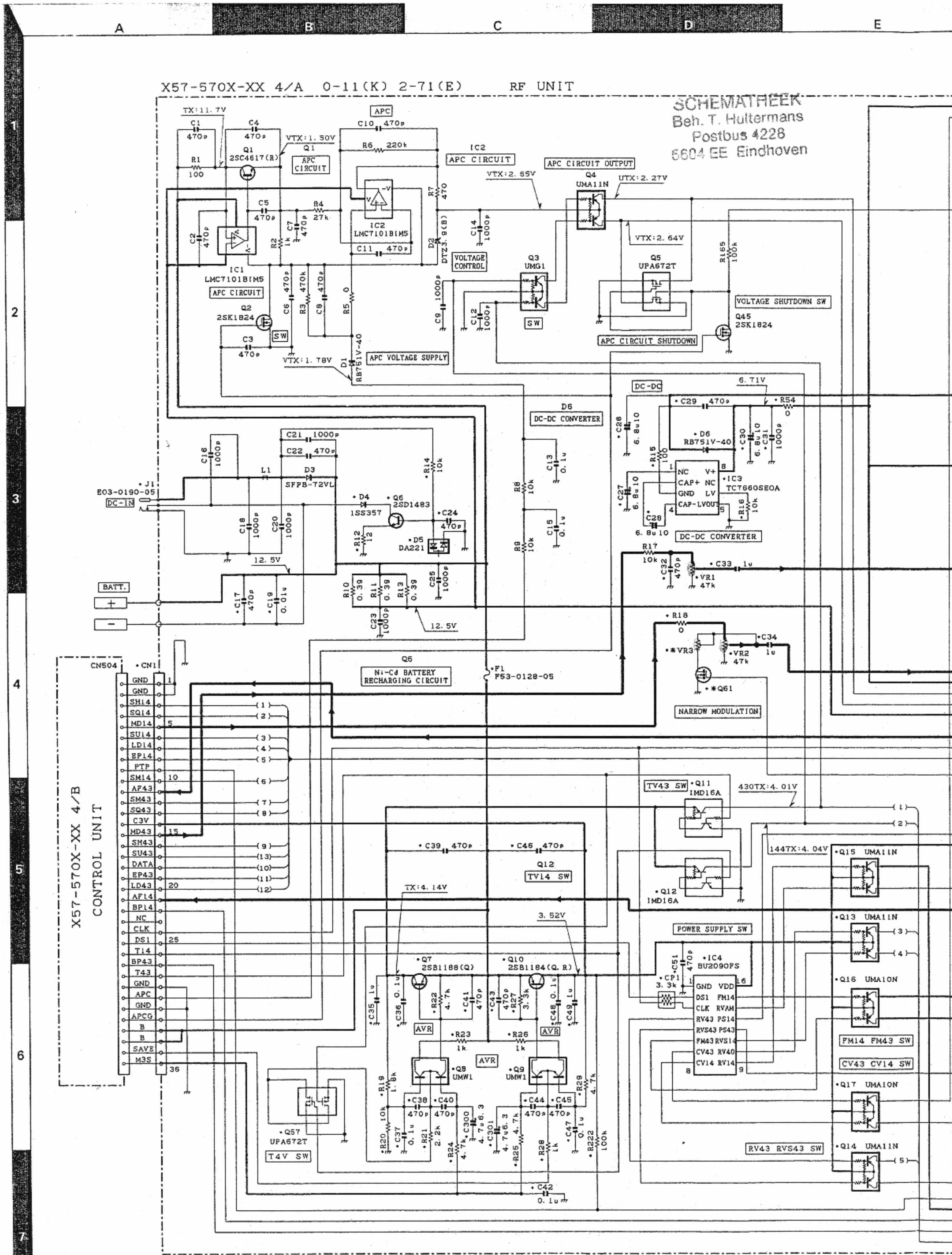


RF UNIT (A/4) (Foil side)

Ref. No.	Address
Q1	10B
Q2	11B
Q3	10D
D1	11D
D2	12D
D3	12D

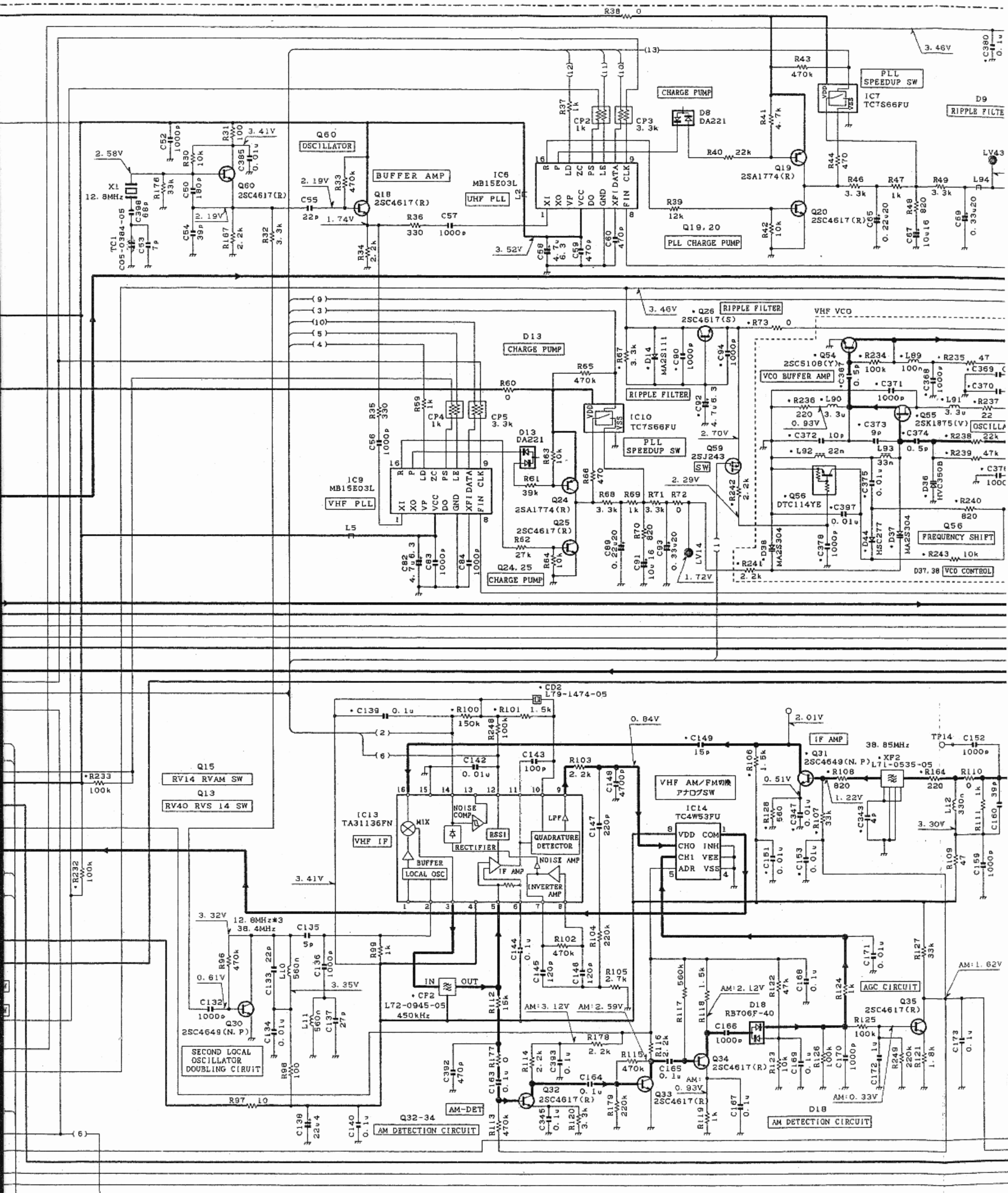
2SC5108(Y)
2SC5006
2SC4997





D1, 6 :RB751V-40 D3 :SFPB-72VL D5, 8, 13, 19, 29 :DA221 D9, 14 :MA2S111 D20, 30 :HVU131 D24, 26 :DAN235E
D2 :DTZ3. 9(B) D4 :1SS357 D10-12, 15, 17, 21, 22, 25, 31, 42-44 :HSC277 D18 :RB706F-40 D23, 40 :DAN222 D27, 28, 32-34, 36 :HVC350B

F G H I J

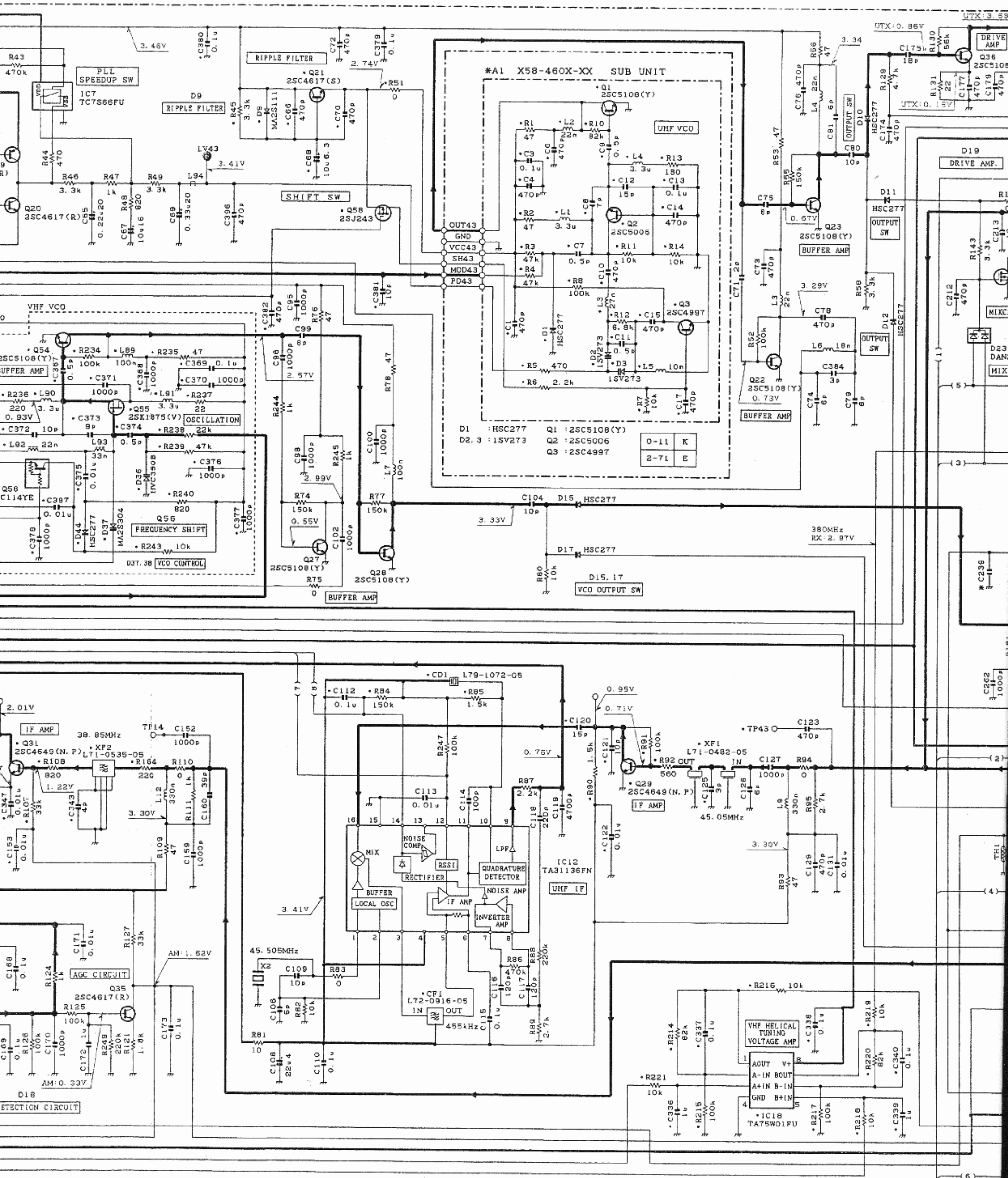


D37, 38	: MA2S304	Q1, 18, 20, 25, 32-35, 52, 60	: 2SC4617(R)	Q3	: UMG1	Q5, 57	: UPA672T	Q7	: 2SB1188(Q)	Q10	: 2SB1184(Q, R)
		Q2, 38, 45, 61-63	: 2SK1824	Q4, 13-15	: UMA11N	Q6	: 2SD1483	Q8, 9	: UMW1	Q11, 12	: IMD16A

Q16, 17 : UMA10N
Q19, 24 : 2SA177

J K L M N

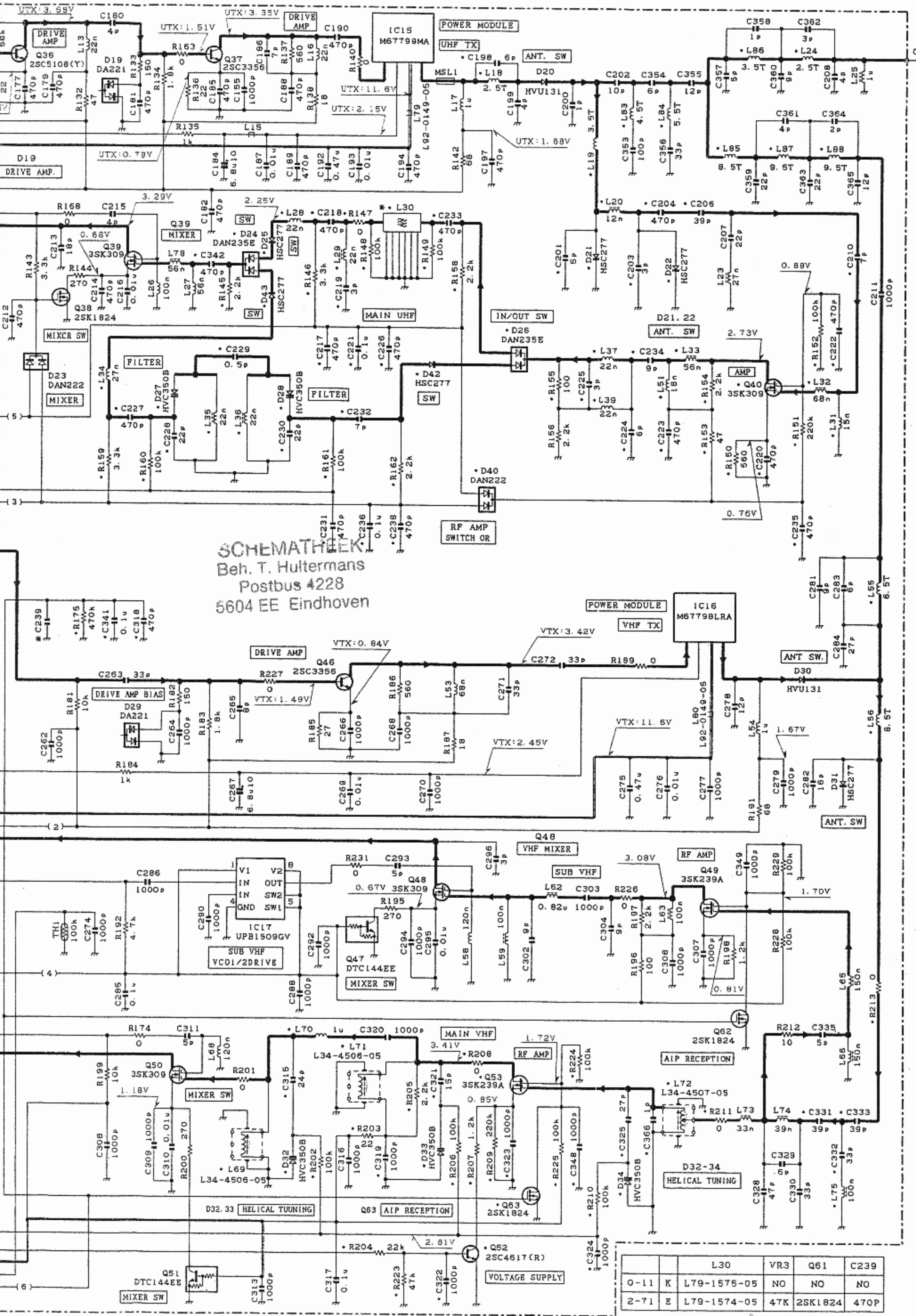
Note) ● Ref. No. : Parts of pattern 1



12 :2SB1184(Q.R) :IMD15A
Q16.17 :UMA1ON
Q19.24 :2SA1774(R)
Q21.26 :2SC4617(S)
Q22.23.27.28.36.54 :2SC5108(Y)
Q29-31 :2SC4649(N.P)
Q37.46 :2SC3356
Q39.40.48.50 :3SK309
Q47.51 :DTC144EE
Q49.53 :3SK239A
Q55 :2SK1875(V)
Q56
Q58.59

s of pattern 1.

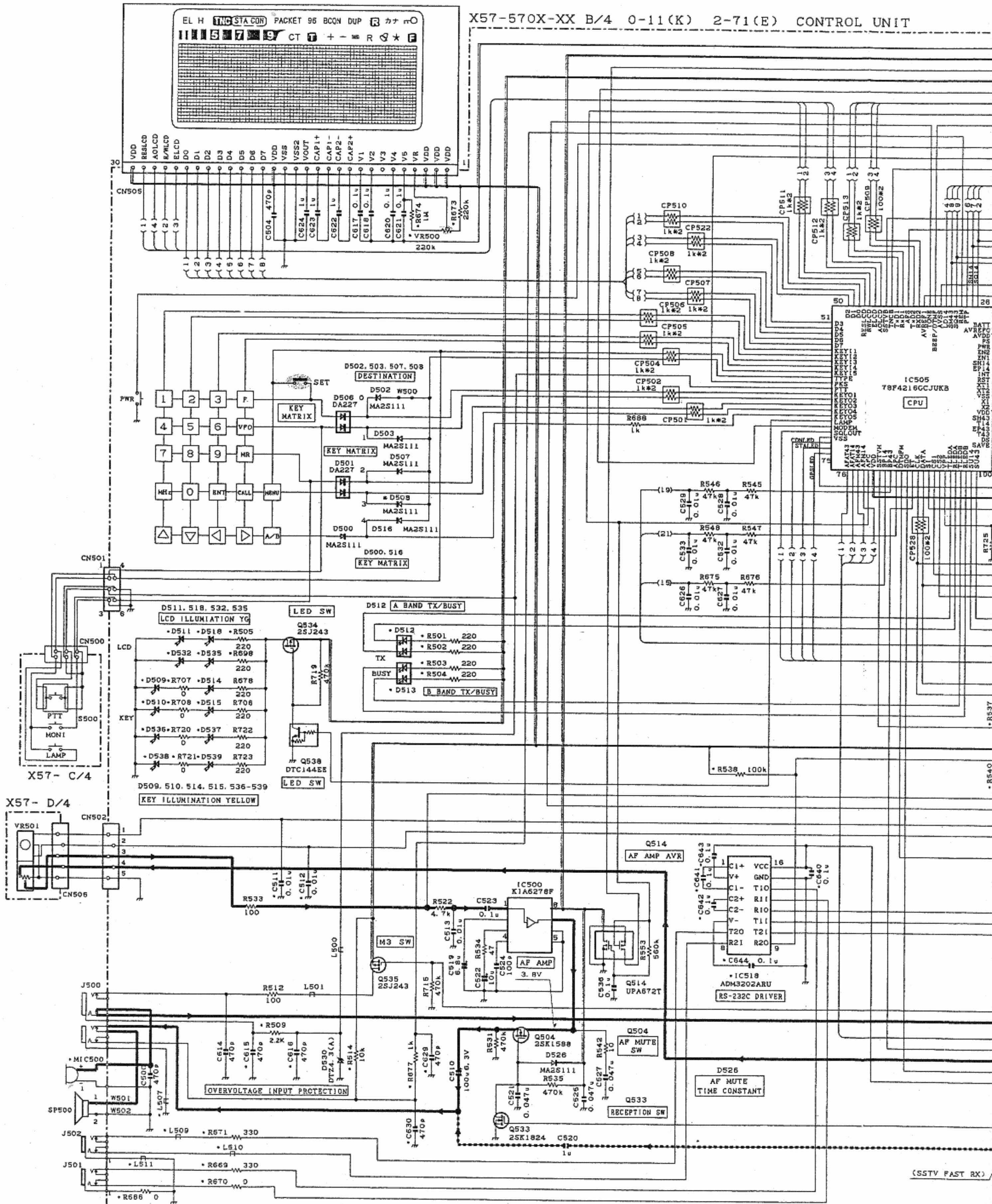
SCHEMATIC DIAGRAM TH-D7A/E



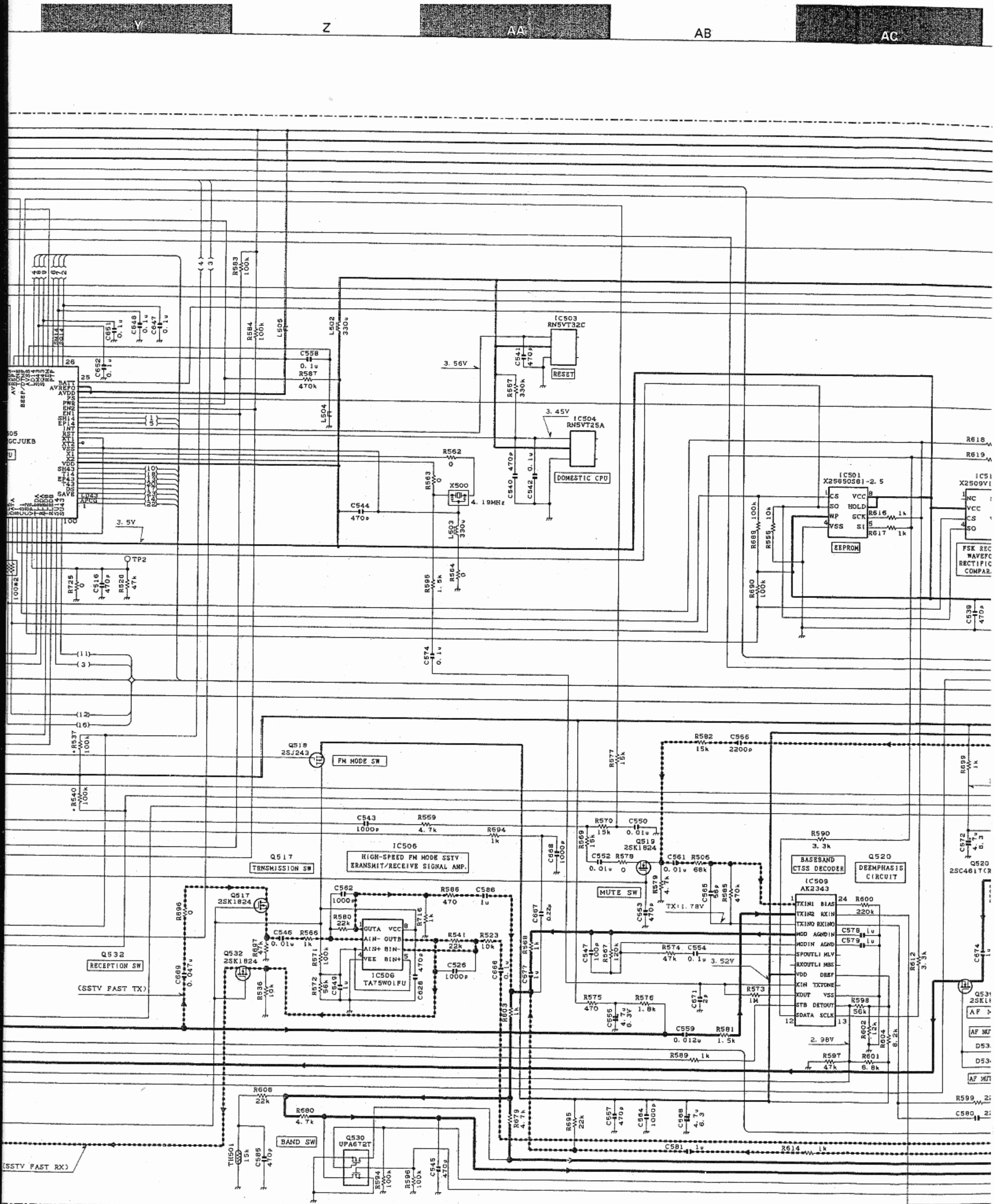
		L30	VR3	Q61	C239
0-11	K	L79-1575-05	NO	NO	NO
2-71	E	L79-1574-05	47K	2SK1824	470P

Q56 :DTC114YE IC1, 2 :LMC7101BIM5 IC4 :BU2090FS IC7, 10 :TC7S66FU IC14 :TC4W53FU IC16 :M67797LRA IC18 :TA75W01FU
Q58, 59 :2SJ243 IC3 :TC7660SEOA IC6, 9 :MB15E03L IC12, 13 :TA31136FN IC15 :M67799MA IC17 :UPB1509GV

TH-D7A/E SCHEMATIC DIAGRAM

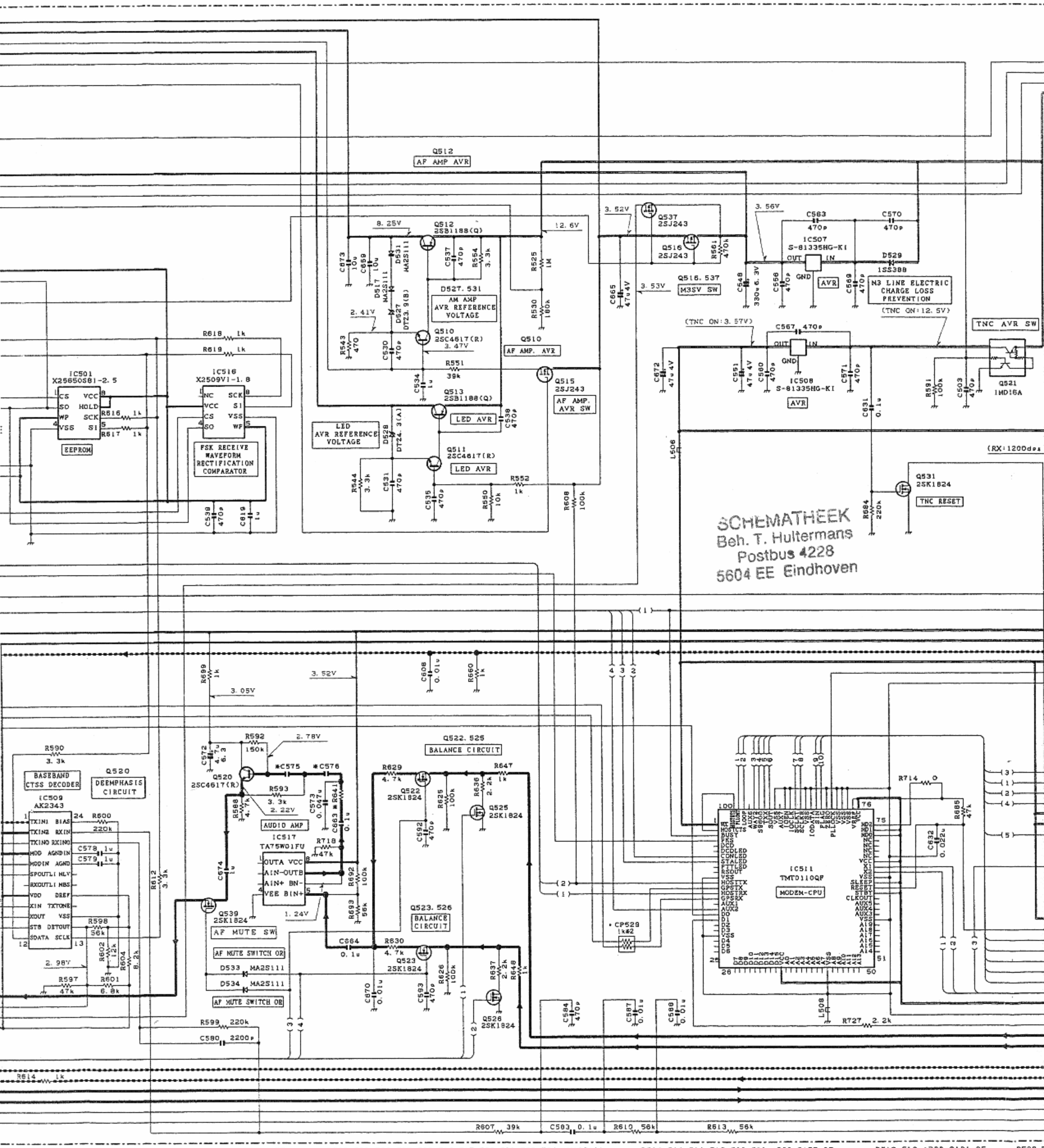


IC500 : K1A6278F
IC501 : X25650881-2.5
IC503 : RN5VT32C
IC504 : RN5VT25A
IC505 : 78F4216GCJUKB
IC506, 514, 517 : TA75W01FU
IC507, 508 : S-81335HG-KI
IC509 : AK2343
IC510 : TGT0210Q
IC511 : TMT0110QF
IC512 : TA75W393FU
IC513 : BU4053BCFV
IC515 : TA
IC516 : X2



IC515 : TA75S393F IC518 : ADM3202ARU Q504, 533 : 2SK1588 Q512, 513 : 2SB1188(Q) Q515, 516, 518, 534, 535, 537 : 2SJ243 Q521 : IMD16A Q538

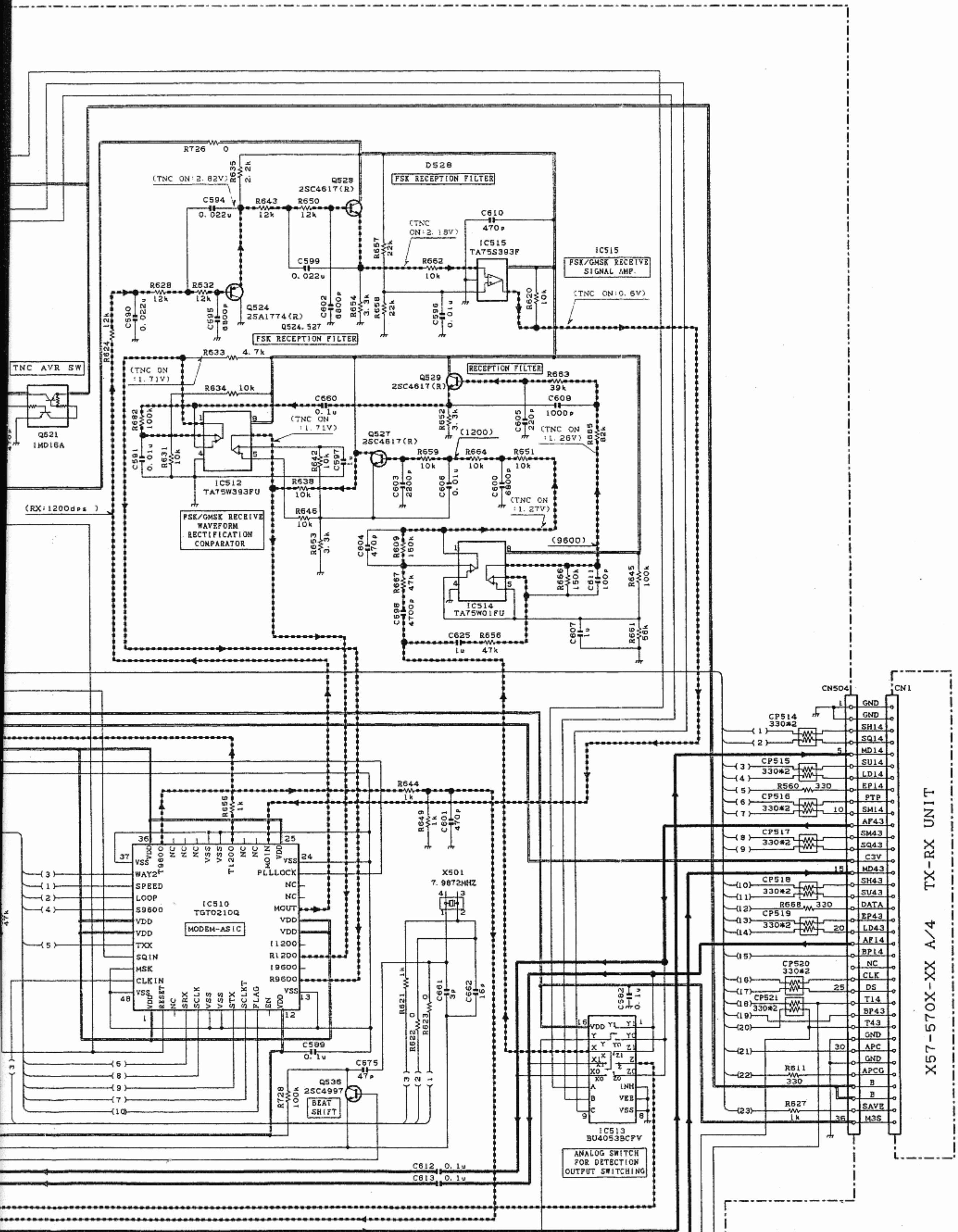
IC516 : X25097VI-1.8 Q510, 511, 520, 527-529 : 2SC4617(R) Q514, 530 : UPA672T Q517, 519, 522, 523, 525, 526, 531, 532, 539 : 2SK1824 Q524 : 2SA1774(R)



Q515, 537 : 2SJ243 Q521 : IMD16A Q538 : DTC144EE D500, 502, 503, 507, 508, 516, 517, 526, 531, 533, 534 : MA2S111 D509, 510, 514, 515, 536-539 : B30-2157-05 D512, 513 : B30-2131-05 D528, 5…

…39 : 2SK1824 Q524 : 2SA1774(R) D501, 506 : DA227 D511, 518, 532, 535 : B30-2143-05 D527 : DTZ3.9(B) D529

Note) ● Ref. No. : Parts of pattern 1.

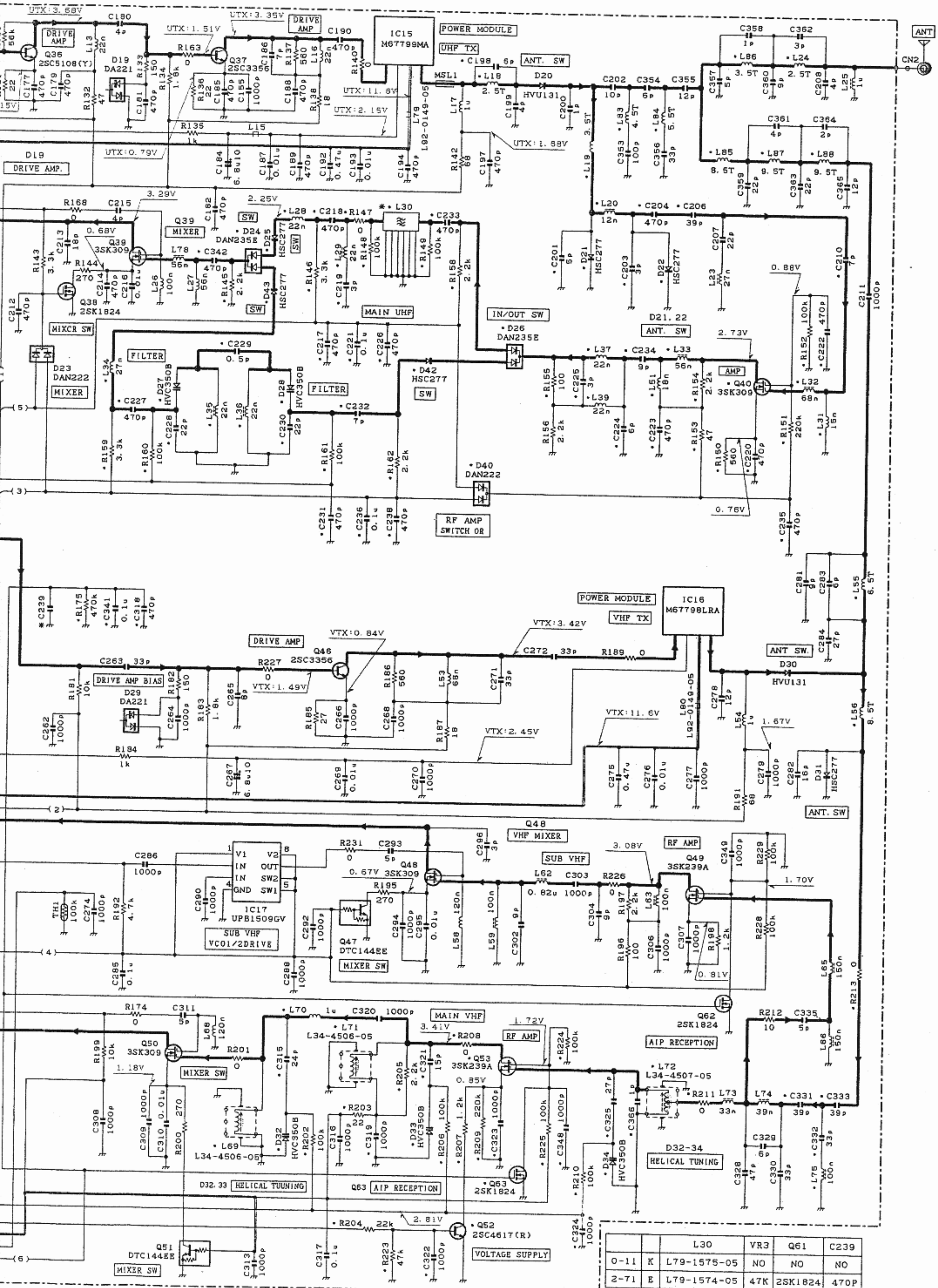


		D508	C575	C576	R641
0-11	K	MA2S111	0.1u	0.1u	10k
2-71	E	NO	0.022u	0.022u	8.2k

31-05 D528, 530 :DTZ4.3(A)
(B) D529 :1SS388

rts of pattern 1.

SCHEMATIC DIAGRAM TH-D7A/E

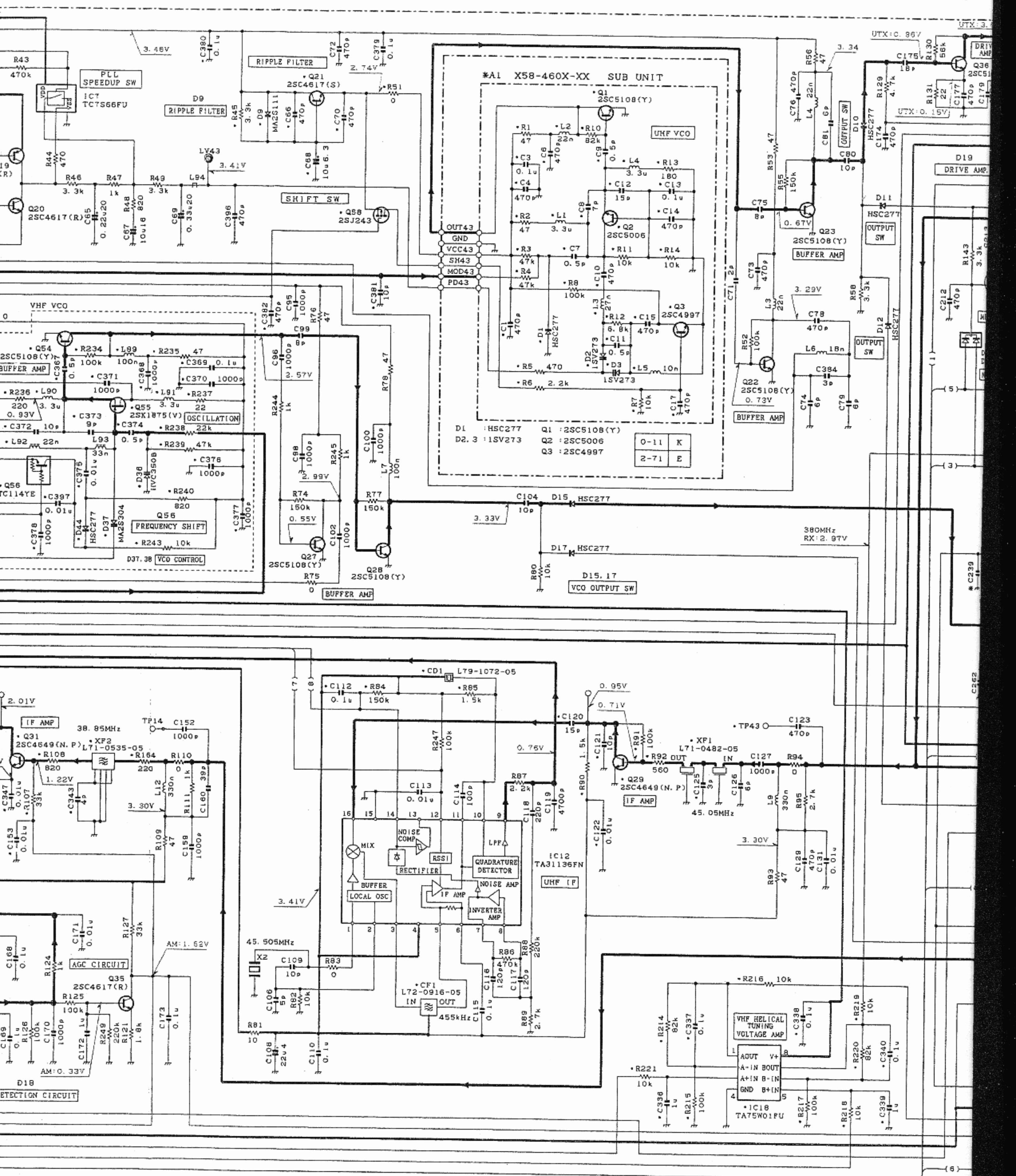


	L30	VR3	Q61	C239
0-11 K	L79-1575-05	NO	NO	NO
2-71 E	L79-1574-05	47K	2SK1824	470P

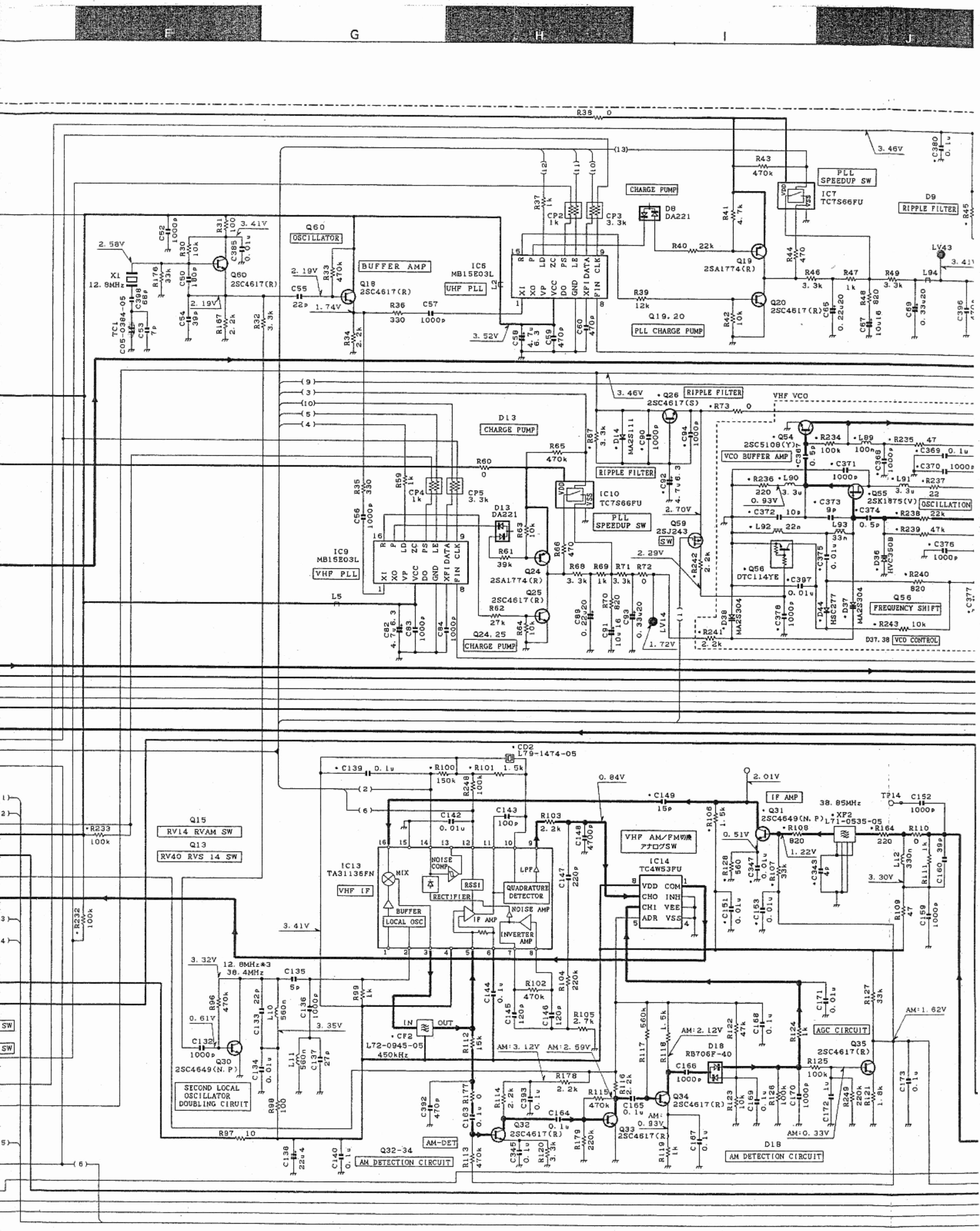
Q56 : DTC114YE
Q58, 59 : 2SJ243
IC1, 2 : LMC7101BIM5
IC3 : TC7660SEOA
IC4 : BU2090FS
IC6, 9 : MB15E03L
IC7, 10 : TC7S66FU
IC12, 13 : TA31136FN
IC14 : TC4W53FU
IC15 : M67799MA
IC16 : M67797LRA
IC17 : UPB1509GV
IC18 : TA75W01FU

J K L M N

Note) ● Ref. No. : Parts of patte



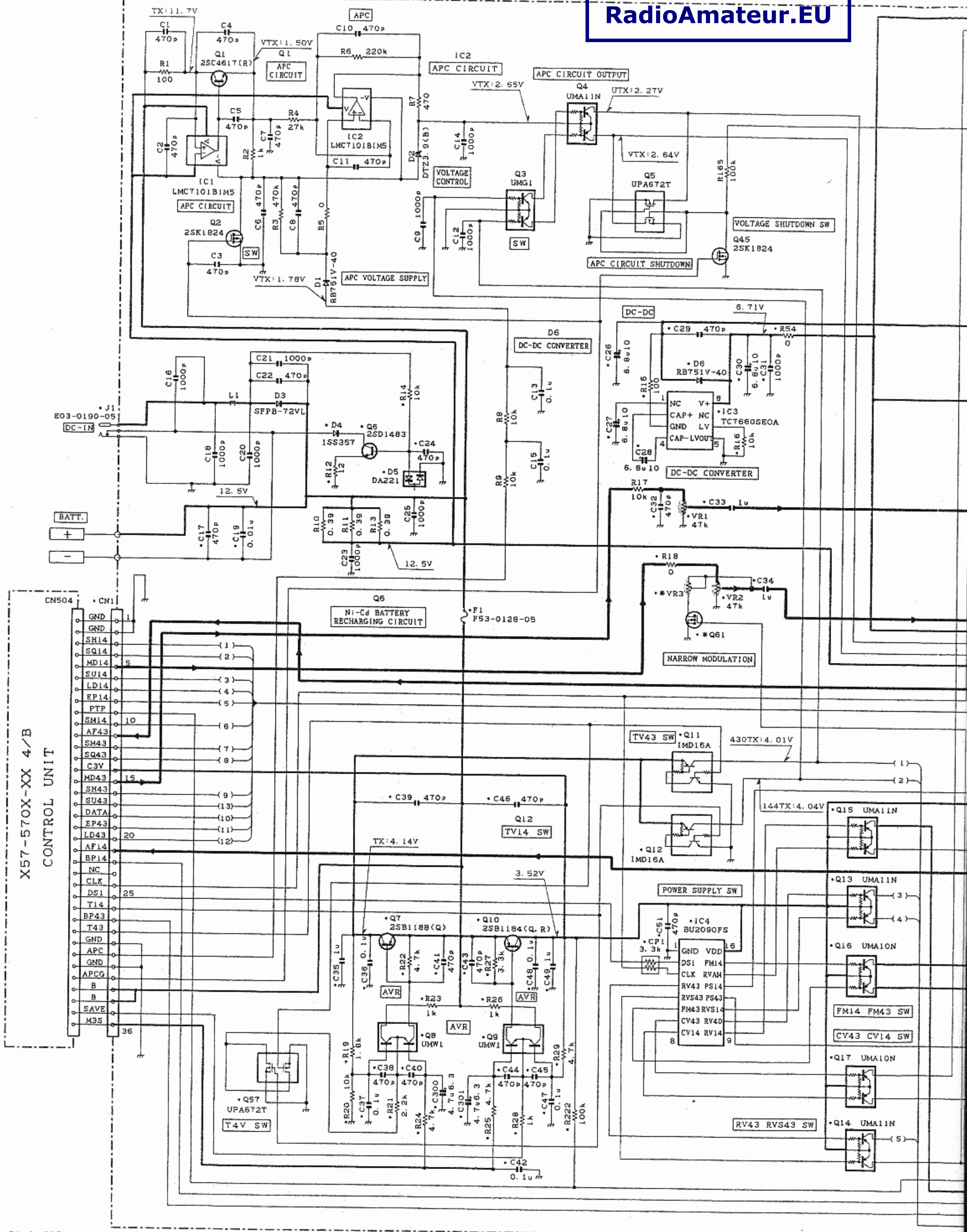
	:2SB1184(Q,R)	Q16,17	:UMA10N	Q21,26	:2SC4617(S)	Q29-31	:2SC4649(N,P)	Q39,40,48,50	:3SK309	Q49,53	:3SK239A	Q56	
12	:IMD16A	Q19,24	:2SA1774(R)	Q22,23,27,28,36,54	:2SC5108(Y)	Q37,46	:2SC3356	Q47,51	:DTC144EE	Q55	:2SK1875(V)	Q58,5	



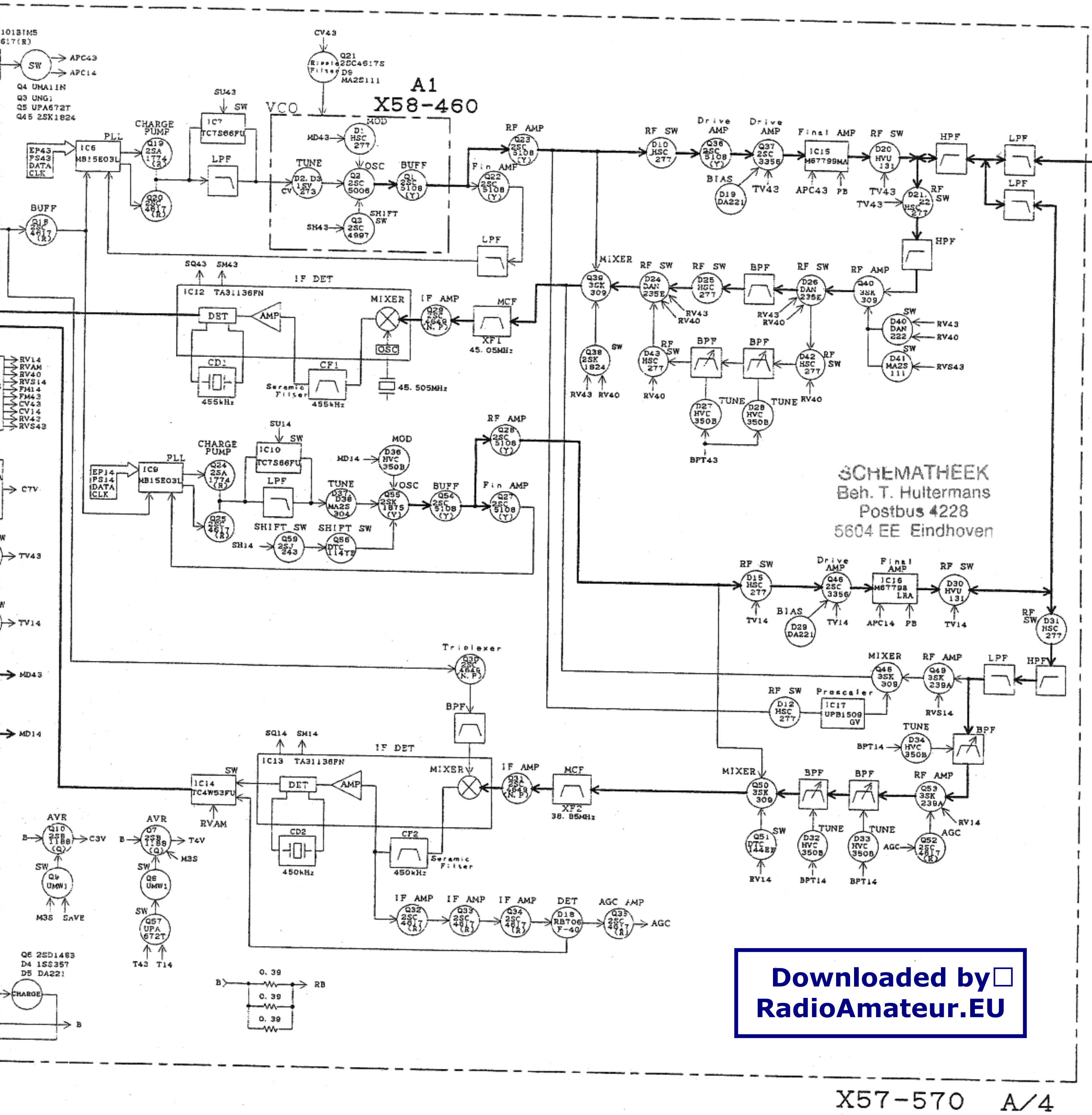
235E D37, 38 :MA2S304 Q1, 18, 20, 25, 32-35, 52, 60 :2SC4617(R) Q3 :UMG1 Q5, 57 :UPA672T Q7 :2SB1188(Q) Q10 :2SB1184(Q, R) Q16, 17 :UMA1ON

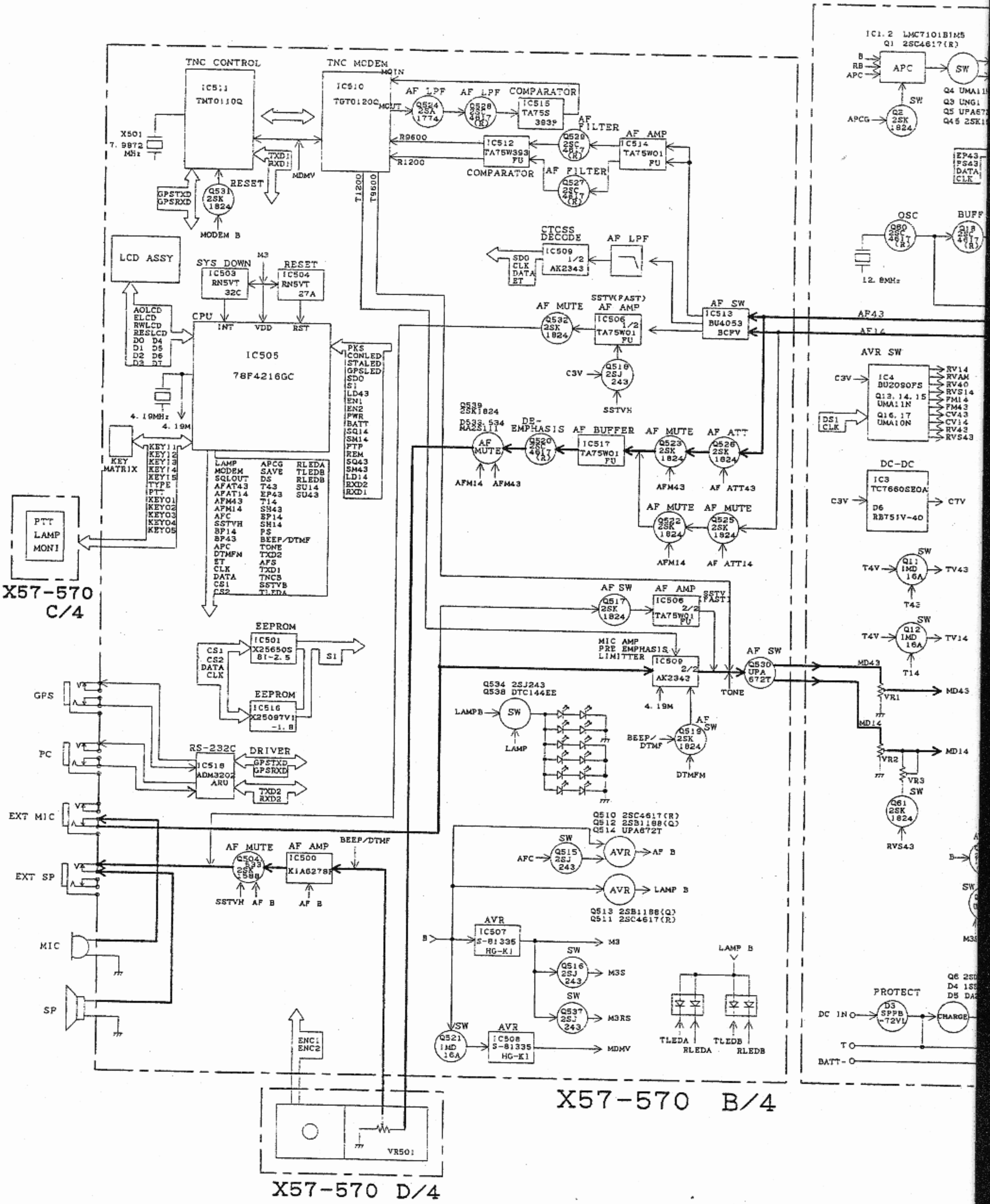
350B Q2, 38, 45, 61-63 :2SK1824 Q4, 13-15 :UMA11N Q6 :2SD1483 Q8, 9 :UMW1 Q11, 12 :IMD16A Q19, 24 :2SA1774(R)

X57-570X-XX 4/A 0-11(K) 2-71(E) RF UNIT



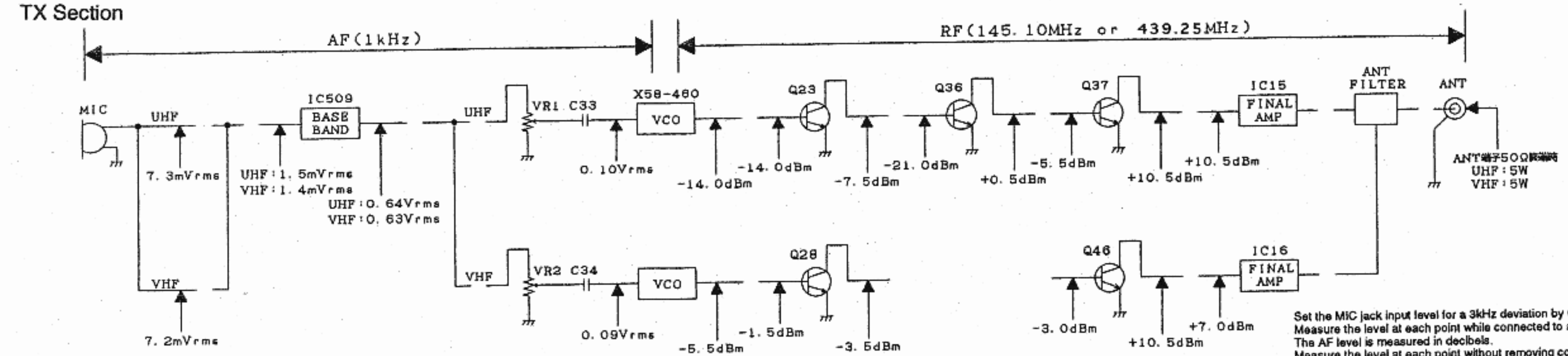
D1, 6 : RB751V-40
D2 : DTZ3.9(B)
D3 : SFPB-72VL
D4 : 1SS357
D5, 8, 13, 19, 29 : DA221
D10-12, 15, 17, 21, 22, 25, 31, 42-44 : HSC277
D9, 14 : MA2S111
D18 : RB706F-40
D20, 30 : HVU131
D23, 40 : DAN222
D24, 26 : DAN235E
D27, 28, 32-34, 36 : HVC350B
D37,


A1
X58-460
VCO
MOD
TUNE
OSC
BUFF
SHIFT SW
CHARGE PUMP
PLL
IC6 MB15E03L
IC7 TC7S66FU
LPF
RF AMP
Fin AMP
RF SW
Drive AMP
Final AMP
IC15 M67799MA
HPF
ANT
BIAS
MIXER
BPF
IF DET
IC12 TA31136FN
DET
AMP
IF AMP
MCF
XF1
45.05MHz
OSC
45.505MHz
CD1
455kHz
CF1
Seramic Filter
IC9 MB15E03L
IC10 TC7S66FU
IC16 M67798LRA
Triplexer
IC13 TA31136FN
IC14 TC4W53FU
XF2
38.85MHz
CD2
450kHz
CF2
Prescaler
IC17 UPB1509GV
AVR
AGC
DET
0.39
X57-570 A/4


TNC CONTROL
IC511
TNT0110Q
TNC MODEM
IC510
TGT0120Q
X501
7.9872 MHz
AF LPF
AF LPF
COMPARATOR
IC515
TA75S393F
AF FILTER
AF AMP
IC514
TA75W01FU
IC512
TA75W393FU
COMPARATOR
AF FILTER
R9600
R1200
TXD1
RXD1
MDMV
T1200
T9600
RESET
GPSTXD
GPSRXD
Q531
2SK1824
MODEM B
LCD ASSY
SYS DOWN
IC503
RN5VT32C
M3
RESET
IC504
RN5VT27A
CTCSS DECODE
IC509 1/2
AK2343
AF LPF
SDO
CLK
DATA
ET
CPU
INT
VDD
RST
IC505
78F4216GC
AOLCD
ELCD
RWLCD
RESLCD
4.19MHz
4.19M
KEY MATRIX
PTT
LAMP
MONI
X57-570 C/4
AF MUTE
Q532
2SK1824
SSTV(FAST) AF AMP
IC506 1/2
TA75W01FU
Q518
2SJ243
C3V
SSTVH
AF SW
IC513
BU4053BCPV
AF43
AF14
DE-EMPHASIS
AF BUFFER
AF MUTE
AF ATT
IC517
TA75W01FU
Q523
2SK1824
Q526
2SK1824
AFM14
AFM43
AF ATT43
AF MUTE
AF MUTE
Q522
2SK1824
Q525
2SK1824
AF ATT14
AF SW
AF AMP
Q517
2SK1824
IC506 2/2
TA75W01FU
SSTV (FAST)
MIC AMP
PRE EMPHASIS
LIMITTER
IC509 2/2
AK2343
4.19M
AF SW
Q530
UPA672T
TONE
AF SW
Q519
2SK1824
BEEP/DTMF
DTMFM
EEPROM
IC501
X25650S81-2.5
EEPROM
IC516
X25097V1-1.8
CS1
CS2
DATA
CLK
S1
RS-232C DRIVER
IC518
ADM3202ARU
GPSTXD
GPSRXD
TXD2
RXD2
GPS
PC
EXT MIC
EXT SP
MIC
SP
Q534 2SJ243
Q538 DTC144EE
LAMPB
SW
LAMP
AF MUTE
AF AMP
IC500
KIA6278F
BEEP/DTMF
SSTVH
AF B
Q510 2SC4617(R)
Q512 2SB1188(Q)
Q514 UPA672T
Q515
2SJ243
AFC
AVR
AF B
AVR
LAMP B
Q513 2SB1188(Q)
Q511 2SC4617(R)
AVR
IC507
S-81335HG-K1
M3
Q516
2SJ243
M3S
Q537
2SJ243
M3RS
Q521
IMD16A
AVR
IC508
S-81335HG-K1
MDMV
LAMP B
TLEDA
RLEDA
TLEDB
RLEDB
ENC1
ENC2
X57-570 B/4
VR501
X57-570 D/4
IC1, 2 LMC7101BIM5
Q1 2SC4617(R)
APC
SW
APCG
Q2
2SK1824
OSC
BUFF
12.8MHz
AVR SW
IC4
BU2090FS
Q13, 14, 15
UMA11N
Q16, 17
UMA10N
DS1
CLK
RV14
RVAM
RV40
RVS14
FM14
FM43
CV43
CV14
RV43
RVS43
DC-DC
IC3
TC7660SEOA
D6
RB751V-40
CTV
T4V
Q11
IMD16A
TV43
T43
Q12
IMD16A
TV14
T14
MD43
VR1
MD14
VR2
VR3
Q61
2SK1824
RVS43
PROTECT
DC IN
D3
SFPB-72V1
CHARGE
BATT-

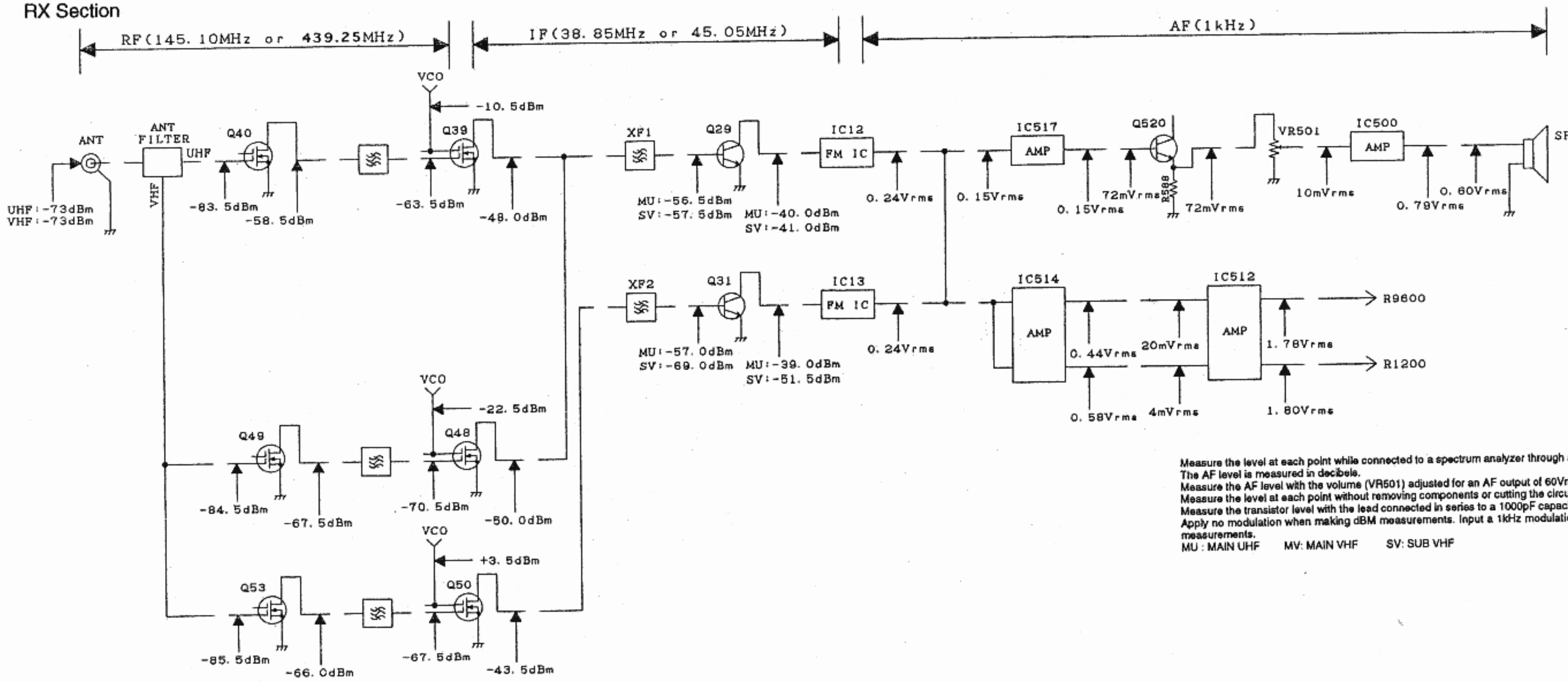
LEVEL DIAGRAM

TX Section



Set the MIC jack input level for a 3kHz deviation by using a modulation frequency of 1kHz.
Measure the level at each point while connected to a spectrum analyzer through a 1000pF capacitor.
The AF level is measured in decibels.
Measure the level at each point without removing components or cutting the circuit board pattern.
Measure the transistor level with the lead connected in series to a 1000pF capacitor.
Apply no modulation when making dBM measurements. Input a 1kHz modulation frequency for Vrms measurements.

RX Section



Measure the level at each point while connected to a spectrum analyzer through a 1000pF capacitor.
The AF level is measured in decibels.
Measure the AF level with the volume (VR501) adjusted for an AF output of 60Vrms.
Measure the level at each point without removing components or cutting the circuit board pattern.
Measure the transistor level with the lead connected in series to a 1000pF capacitor.
Apply no modulation when making dBM measurements. Input a 1kHz modulation frequency for Vrms measurements.
MU : MAIN UHF MV: MAIN VHF SV: SUB VHF

TH-D7A/E

WIRING DIAGRAM

